11.DATA BASE CONCEPTS (2M)

Model 1:For a given table, key/cardinality/ etc

1. Observe the following table and answer the parts(i) and(ii) accordingly . 2019SP2

Table:Product

Pno	Name	Qty	PurchaseDate
101	Pen	102	12-12-2011
102	Pencil	201	21-02-2013
103	Eraser	90	09-08-2010
109	Sharpener	90	31-08-2012
113	Clips	900	12-12-2011

Answer: (i) Write the names of most appropriate columns, which can be considered as candidate keys.

Ans) Candidate Key: Pno, Name

(ii) What is the degree and cardinality of the above table?

Ans) Degree:4 Cardinality:5

2) Observe the following tables VIDEO and MEMBER carefully and write the name of the RDBMS operation out of (i) SELECTION (ii) PROJECTION (iii) UNION (iv) CARTESIAN PRODUCT, which has been used to produce the output as shown below. Also, find the Degree and Cardinality of the final result. 2018

TABLE: VIDEO

VNO	VNAME	TYPE
F101	The Last Battle	Fiction
C101	Angels and Devils	Comedy
A102	Daredevils	Adventure

TABLE : MEMBER

MNO	MNAME
M101	Namish Gupta
M102	Sana Sheikh
M103	Lara James

TABLE : FINAL RESULT

VNO	VNAME	TYPE	MNO	MNAME
F101	The Last Battle	Fiction	M101	Namish Gupta
F101	The Last Battle	Fiction	M102	Sana Sheikh
F101	The Last Battle	Fiction	M103	Lara James
C101	Angels and Devils	Comedy	M101	Namish Gupta
C101	Angels and Devils	Comedy	M102	Sana Sheikh
C101	Angels and Devils	Comedy	M103	Lara James
A102	Daredevils	Adventure	M101	Namish Gupta
A102	Daredevils	Adventure	M102	Sana Sheikh
A102	Daredevils	Adventure	M103	Lara James

Ans) Cartesian Product

Degree = 5 Cardinality = 9

3. Observe the following table MEMBER carefully and write the name of the RDBMS operation out of (i) SELECTION (ii) PROJECTION (iii) UNION (iv) CARTESIANPRODUCT, which has been used to produce the output as shown in RESULT. Also, find the Degree and Cardinality of the RESULT. (2017)

MEMBER

No	MNAME	STREAM
M001	JAYA	SCIENCE
M002	ADITYA	HUMANITIES
M003	HANSRAJ	SCIENCE
M004	SHIVAK	COMMERCE

TABLE : RESULT

NO	MNAME	STREAM
M002	ADITYA	HUMANITIES

Ans) (i) SELECTION

Degree=3 Cardinality=1

4.Observe the table 'Club' given below:(2017MP)

CLUB

Member_id	Member_Name	Address	Age	Fee
M001	Sumit	New Delhi	20	2000
M002	Nisha	Gurgaon	19	3500
M003	Niharika	New Delhi	21	2100
M004	Sachin	Faridabad	18	3500

i. What is the cardinality and degree of the above given table?

ii. If a new column contact_no has been added and three more members have joined the club then how these changes will affect the degree and cardinality of the above given table.

A) i. Cadinality: 4 Degree: 5

ii. Cardinality: 7 Degree: 6

5.The following STUDENTS and EVENTS tables carefully and write the name of the RDBMS operation which will be used to produce the output as shown in LIST ? Also, find the Degree and Cardinality of the LIST. (2016 D)

STUDENTS

NO	NAME
1	Tara Mani
2	Jaya Sarkar
3	Tarini Trikha

EVENTS

EVENTCODE	EVENTNAME
1001	Programming
1002	IT Quiz

LIST

NO	NAME	EVENTCODE	EVENTNAME
1	Tara Mani	1001	Programming
1	Tara Mani	1002	IT Quiz
2	Jaya Sarkar	1001	Programming
2	Jaya Sarkar	1002	IT Quiz
3	Tarini Trikha	1001	Programming
3	Tarini Trikha	1002	IT Quiz

A) **Cartesian Product**

Degree = 4 Cardinality = 6

6) Observe the following table carefully and write the names of the most appropriate columns, which can be considered as (i) candidate keys and (ii) primary key. (2015)

Code	Item	Qty	Price	Transaction Date
1001	Plastic Folder 14"	100	3400	2014-12-14
1004	Pen Stand Standard	200	4500	2015-01-31
1005	Stapler Mini	250	1200	2015-02-28
1009	Punching Machine Small	200	1400	2015-03-12
1003	Stapler Big	100	1500	2015-02-02

Ans) Candidate keys : Code, Item

Primary keys : Code

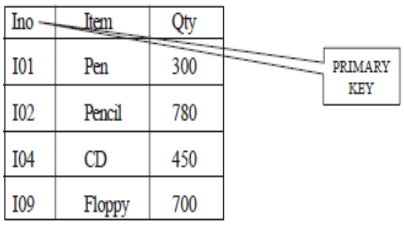
MODEL 2: THEORY QUESTION

KEYS

1) What do you understand by Primary Key? Give a suitable example of Primary Key from a table containing some meaningful data. (OD 2010) 2

Ans. An attribute or set of attributes which are used to identify a tuple uniquely is known as Primary Key.

Table: Item



2) What is the importance of a primary key in a table? Explain with suitable example. (OD 2007)

Ans:**Primary Key:** A primary key is a set of one or more attributes that can uniquely identify tuples within the relations. A primary key comprises a single column or set of columns. No two distinct rows in a table can have the same value (or combination of values) in those columns. Depending on its designing, a table may have arbitrarily many candidate keys but at most one primary key. The primary key is non redundant. Ie it does not have duplicate values in the same relation.

Eg: Consider a table consists the following attributes: AdmnNo,FirstName,LastName,SirName, M1, M2, M3, Total,Avg,FName

Here we can uniquely identify the rows in the relation with following key combinations:

a)AdmnNo

b)FirstName,LastName,SirName

c)FirstName,LastName,FName, etc.

We can set any one of the above candidate keys as primary key, others are called as alternate keys.

3) Give a suitable example of a table with sample data and illustrate Primary and Candidate Keys in it.(2012 D)

Ans A table may have more than one such attribute/group of attribute that identifies a row/tuple uniquely, all such attribute(s) are known as Candidate Keys. Out of the Candidate keys, one is selected as Primary Key.

Ex: Table: Stock

Ino	Item	Qty
101	Pen	560
102	Pencil	780
104	CD	450
109	Floppy	700
105	Eraser	300
103	Duster	200

Here: Ino – Primary Key

Ino, Item – Candidate Keys,

4) Give a suitable example of a table with sample data and illustrate Primary and Alternate Keys in it. (2012OD)

Ans A table may have more than one such attribute/group of attribute that Identifies a row/tuple uniquely, all such attribute(s} are known as Candidate Keys. Out of the Candidate keys, one is selected as Primary Key. while the rest are the Alternate Keys.

Ex: Table: Stock

Ino	Item	Qty
101	Pen	560
102	Pencil	780
104	CD	450
109	Floppy	700
105	Eraser	300
103	Duster	200

Here: Ino, Item – Candidate Keys,

Ino – Primary Key

Item – Alternate Key

Explain the concept of candidate key with the help of an appropriate example. (2013)(2010D)(D2009)2

5) What is the purpose of a key in a table? Give an example of a key in a table. (OD 2009)2

Ans) An attribute/group of attributes in a table that identifies each tuple uniquely is known as a Key.

OR

Any correct definition of Key / Primary Key / Candidate Key / Alternate Key

Table:Item

Ino	Item	Qty
I01	Pen	560
I02	Pencil	780
I04	CD	450
I09	Floppy	700
I05	Eraser	300
I03 Duster	200	

Key

6) Differentiate between Candidate key and Primary key in context of RDBMS. (D2008)

Differentiate between Candidate Key and alternate Key in context of RDBMS. (OD 2008)

Differentiate between primary key and alternate key. (D2007)

What is an alternate key? (D2006)

What do you understand by the terms primary key and degree of a relation in relational data base? (D2005)

What do you understand by the candidate key and cardinality of a relation in relational data base? (OD 2005)

What is primary key in a table? (2003)

Ans) Candidate Key: All attribute combinations inside a relation that can serve primary key are Candidate Keys as they are candidates for the primary key position.

Primary Key: A primary key is a set of one or more attributes that can uniquely identify tuples within the relations.

Alternate Key: A candidate key that is not the primary key is called an Alternate Key.

(Where Candidate Key: All attribute combinations inside a relation that can serve primary key(uniquely identifies a row in a relation) are Candidate Keys as they are candidates for the primary key position.)

Table: Stock

Ino	Item	Qty
101	Pen	560
102	Pencil	780
104	CD	450
109	Floppy	700
105	Eraser	300
103	Duster	200

Here: Ino, Item – Candidate Keys,
Ino – Primary Key
Item – Alternate Key

7) What is a relation? What is the difference between a tuple and an attribute? (1998)

Ans: In relational data model, the data is organized into table (rows and columns). These tables are called relations. A row in a table represents a relationship among a set of values.

Rows of the relations are called as tuples and columns of the relations are called as attributes.

8) What do you understand by Degree and Cardinality of a table? (MP109-10) (MP108-09)2

Ans) Degree: Number of Columns in a table
Cardinality: Number of rows in a table

Ex: TABLE : MEMBER

MNO	MNAME
M101	Namish Gupta
M102	Sana Sheikh
M103	Lara James

Here, Cardinality = 3, Degree = 2

What do you understand by the candidate key and cardinality of a relation in relational data base? (OD 2005)

OPERATIONS

9. Explain the concept of Cartesian Product between tables, with the help of appropriate example. (2014)(2001)

Answer) Cartesian Product (binary operator): It operates on two relations and is denoted by X.

The Cartesian product of two relations yields a relation with all possible combinations of the tuples of the two relations operated upon.

All tuples of first relation are concatenated with all the tuples of second realtion to form the tuples of the new relation.

The Cartesian product of two relations A and B is written as AXB. The Cartesian product yields a new relation which has a degree (number of attributes) equal to the sum of the degrees of the two relations operated upon.

The number of typles (cardinality) of the new relation is the product of the number of tuples of the two relations operated upon.

Eg: There are two relations as follows:

Relation 1: Student

StudentNumber	StudentName	Hosteler
1	Ravi	Y
2	Robert	N
3	Raheem	Y

Relation 2: Instructor

InstructorName	Subject
K.Suman	Computer Science
P.Pavan	Electronics

The Cartesian product of these two relations, Student X Instructor, will yield a relation that have a degree of 5(3+2:sum of degrees of Student and Instructor) and a cardinality 6 (3 X 2: Product of cardinalities of two relations).

The resulting relation is as follows:

Student Number	Student Name	Hosteler	Instructor Name	Subject
1	Ravi	Y	K.Suman	Computer Science
1	Ravi	Y	P.Pavan	Electronics
2	Robert	N	K.Suman	Computer Science
2	Robert	N	P.Pavan	Electronics
3	Raheem	Y	K.Suman	Computer Science
3	Raheem	Y	P.Pavan	Electronics

Resultant Relation = Relation1 X Relation2

The resulting relation contains all possible combinations of tuples of the two relations.

10) What do you understand by Union & Cartesian Product operations in relational algebra?(2011D)2

Ans) Union (binary operator): It operates on two relations and is indicated by U.

For example, R= R1 U R2 represents union operation between two relations R1 and R2. The degree of R is equal to degree of R1. The cardinality of R is sum of cardinality of R1 and cardinality of R2.

Following have to be considered for the operation R1 U R2.

Degree of R1 = Degree of R2
jth attribute of R1 and jth attribute of R2 must have a common domain.

Example : Relation R1

Student_ID	Name
S120	Raju
S121	Nani

Relation R2

Student_Code	Student_Name
K550	Chinna
K551	Munna

Resultant Relation : R = R1 U R2

Student_ID	Name
S120	Raju
S121	Nani
K550	Chinna
K551	Munna

11) What do you understand by Selection & Projection operations in relational algebra? (2011 OD)2

Ans Selection for selecting the rows of table

Projection for selecting the columns of table

Ex: Table MEMBER

No	MNAME	STREAM
M001	JAYA	SCIENCE
M002	ADITYA	HUMANITIES
M003	HANSRAJ	SCIENCE
M004	SHIVAK	COMMERCE

TABLE : TABSEL

NO	MNAME	STREAM
M002	ADITYA	HUMANITIES

TABLE : TABPROJ

No	STREAM
M001	SCIENCE
M002	HUMANITIES
M003	SCIENCE
M004	COMMERCE

Here,

Table **TABSEL** is result of **Selection** operation

Table **TABPROJ** is result of **projection** operation

DDL & DML

12) What are DDL and DML? (OD 2006)

(Differentiate between data definition language and data manipulation language.(2002))

Ans: DDL means Data Definition Language. SQL DDL provides commands for defining relation schemas, deleting relations, creating indexes and modifying relation schemas. (Provides statements for the creation and deletion of tables and indexes.)

DML Means Data Manipulation Language. SQL DML provides statements to enter, update,delete data and perform complex queries on these tables.

(includes a query language to insert, delete and modify tuples in the database)

DML is used to put values and manipulate them in tables and other database objects and DDL is used to create tables and other database objects.

12.STRUCTURED QUERY LANGUAGE (6 Marks)

STUDENT MARKS TABLE

In the following section many of the commands is explained through the example "Student marks table".

S.no	Attribute	Type
1	AdmnNo	Integer
2	SName	Character
3	Sub1	Real Number
4	Sub2	Real Number
5	Sub3	Real Number
6	Total	Real Number
7	Avg	Real Number
8	Divison	Character

1. Create Table:

CREATE TABLE <table-name> (<column name><data type>[(size>)],<column name><data type>[(size>)],…);

Example: To create a table consisting the Admnno, SName, Sub1, Sub2, Sub3, Total,Avg,Divison attributes.

CREATE TABLE Student (AdmnNo integer,SName char(20), Sub1 number(5,2), sub2 number(5,2), sub3 number(5,2), Total number(5,2),Avg number(5,2), Div Char(10));

2.Constraints:

(i) **NOT NULL :** The attribute that contains this constraints should not be vacant.

(ii) **Unique constraints:** This constraint ensures that no two rows have the same value in the specified column(s).

(iii) **Primary key constraints:** This constraint declares a column as the primary key of the table.(Primary keys cannot allow NULL values)

(iv) **Default constraints:** A default value can be specified for a column using DEFAULT clause. When a user does not enter a value for the column, automatically the defined default value is inserted in the field.

(v) **Check constraints:** this constraint limits values that can be inserted into a column of a table.

Above table can be created using the constraints as follows:

CREATE TABLE Student (AdmnNo number(4) NOT NULL PRIMARY KEY, SName char(20), Sub1 number(5,2) CHECK(Sub1<=100.0), Sub2 number(5,2) CHECK(Sub2<=100.0), Sub3 number(5,2) CHECK (Sub3<=100.0), Total number(5,2),Avg number(5,2),Div char(10));

3.INSERT Command:

INSERT INTO <tablename>[<column list>] VALUES(<value>,<value>…);

Eg:

i) To insert our desired attributes only:

INSERT INTO Student (Admnno,SName,Sub1,Sub2,Sub3) Values (1000,'pradeep',75.5,90.5,57.0);

ii) To insert all the attributes:

INSERT INTO Student Values (1001, 'sudeep',77.50,95.0,68.50, 41.0,80.33,'First');

(for inserting number of rows in a easy way…)

INSERT INTO STUDENT(Admnno,SName,Sub1,Sub2, Sub3) VALUES (&Admnno, &SName, &Sub1, &Sub2, &Sub3);

Then it will ask first student data….Enter the data…then press / at command prompt. It will ask you next student data, etc.)

Sample Data Inserted

Admn No	SName	Sub 1	Sub 2	Sub 3	Total	Avg	Div
1000	Pradeep	75.5	95.0	57.0			
1001	Sudeep	77.5	95.0	68.5	241.0	80.33	First
1002	Philip	32.5	60.0	59.5			
1003	Pradeep	45.5	65.5	70.0			
1004	Naidu	77.5	25.5	65.5			
1005	Sudeep	80.5	72.5	67.0			

4.Select command: Select command of SQL lets you make queries on the database. A query is a command that is given to produce certain specified information from the database table(s).

Simple Form:
SELECT<column name>[,<column name>…] FROM <table name>;
Eg: Select AdmnNo,SName from Student.
(Will display only AdmnNo and SName attributes of the table student.)
Select * from Student.
(Will display all the attributes of the table Student.)
5.DISTINCT Keyword: This keyword eliminates duplicate rows from the results of a SELECT statement.
Eg: Select **DISTINCT** SName from Student

Sname
Pradeep
Sudeep
Philip
Naidu

6.ALL Keyword: This keyword will not eliminate duplicate rows from the results of a SELECT statement.
Eg: Select **ALL** SName from student

SName
Pradeep
Sudeep
Philip
Pradeep
Naidu
Sudeep

7. Selecting specific rows using WHERE clause with SELECT:
Syntax: SELECT <column name>[< column name>,…] FROM <table name> WHERE <condition>;
Eg:
SELECT Admnno,SName FROM Student WHERE Sub1>=40 AND Sub2>=40 AND Sub3>=40;
SELECT SName FROM Student WHERE SName='Sudeep' OR SName='Philip;

SName
Sudeep
Philip
Sudeep

SELECT SName FROM Student WHERE SName<>'Naidu'

OR

SELECT SName FROM Student WHERE (NOT SName='Naidu')

SName
Pradeep
Sudeep
Philip
Pradeep
Sudeep

SELECT Sname from student WHERE SName in('Pradeep','Sudeep');

SName
Pradeep
Sudeep
Pradeep
Sudeep

SELECT SName FROM Student WHERE SName NOT IN('Sudeep','Pradeep');

SName
Philip
Naidu

SELECT SName FROM Student WHERE SName LIKE '%eep'

SName
Pradeep
Sudeep
Pradeep
Sudeep

8. Condition based on a Range using BETWEEN:
Eg: SELECT AdmnNo, SName FROM Student WHERE AdmnNo BETWEEN 1003 AND 1005;

AdmnNo	SName
1003	Pradeep
1004	Naidu
1005	Sudeep

9.ORDER BY:
SELECT AdmnNo, SName from student ORDER BY SName ASC;

Admn No	SName
1004	Naidu
1002	Philip
1000	Pradeep
1003	Pradeep
1001	Sudeep
1005	Sudeep

SELECT AdmnNo, SName from student ORDER BY AdmnNo DESC;

Admn No	SName
1005	Sudeep
1004	Naidu
1003	Pradeep
1002	Philip
1001	Sudeep
1000	Pradeep

10. UPDATE COMMAND:
UPDATE Student SET Total= Sub1+Sub2+Sub3;
UPDATE Student SET Avg=Total/3;
UPDATE Student SET Div='First' WHERE (Avg>=60.0);
UPDATE Student SET Div='Second' WHERE (Avg>=50.0 AND Avg<60.0);
UPDATE Student SET Div='Third' WHERE (Avg>=35.0 AND Avg<50.0);
UPDATE Student SET Div='Fail' WHERE (Sub1<35.0 OR Sub2<35.0 OR Sub3<35.0);
After the execution of the above commands, the sample data will be as follows:

Admn No	SName	Sub1	Sub2	Sub3	Total	Avg	Div
1000	Pradeep	75.5	95.0	57.0	227.5	75.85	First
1001	Sudeep	77.5	95.0	68.5	241.0	80.33	First
1002	Philip	32.5	60.0	59.5	152.0	50.66	Fail
1003	Pradeep	45.5	65.5	70.0	181	60.3	First
1004	Naidu	77.5	25.5	65.5	168.5	56.16	Fail
1005	Sudeep	80.5	72.5	67.0	220	73.3	First

11. ALTER TABLE:
ALTER TABLE student MODIFY (Div Char(6));
ALTER TABLE student ADD(CNo NUMBER(10));
12. Functions:
SELECT Min(Sub1) FROM Student;
(Will give the Minimum marks of Subject1)

Min(SUB1)
32.5

SELECT Max(Sub2) FROM Student;
(Will give the Maximum marks of Subject2)

MAX(SUB2)
95

SELECT Sum(Sub3) FROM Student;
(Will give the Sum of marks of Subject3)

SUM(SUB3)
387.5
SELECT Avg(Sub1) FROM Student;
(Will give the Average of Subject1)
AVG(SUB1)
64.83
SELECT Count(DISTINCT SName) FROM Student;
(Will display 4)
COUNT(DISTINCT SNAME)
4
SELECT Count(SName) FROM Student;
(Will display 6)
COUNT(SNAME)
6

Count – To count non-null values in a column
Count(*) – To count total number of rows in a table.

13. Creating table from Existing Table:
CREATE TABLE PassStudent as (SELECT AdmnNo, SName FROM Student WHERE (Sub1>=40.0 AND Sub2>=40.0 AND Sub3>=40.0));

14. Inserting the Results of a Query:
INSERT INTO PassStudent(admnno,sname)
SELECT AdmnNO, SName FROM Student
WHERE (Sub1>=40.0 AND Sub2>=40.0 AND Sub3>=40.0);

15. CREATE VIEW:
CREATE VIEW FailStudent AS SELECT * FROM Student WHERE Div='Fail';

16. DELETE:
DELETE FROM Student WHERE AdmnNo=1004;
(To delete a record, whose AdmnNo=1004)
DELETE FROM Student;
(To delete all records of student)

17.DROP TABLE:
DROP TABLE Student;

18. DROP VIEW:
DROP VIEW Failstudent;

19.Commit (To save the changes)

20.Rollback (for Undo)

MODEL 1(VERY IMP) : TWO TABLES

1.Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the tables. 2019SP6

TRAINER

TID	TNAME	CITY	HIREDATE	SALARY
101	SUNAINA	MUMBAI	1998-10-15	90000
102	ANAMIKA	DELHI	1994-12-24	80000
103	DEEPTI	CHANDIGARG	2001-12-21	82000
104	MEENAKSHI	DELHI	2002-12-25	78000
105	RICHA	MUMBAI	1996-01-12	95000
106	MANIPRABHA	CHENNAI	2001-12-12	69000

COURSE

CID	CNAME	FEES	STARTDATE	TID
C201	AGDCA	12000	2018-07-02	101
C202	ADCA	15000	2018-07-15	103
C203	DCA	10000	2018-10-01	102
C204	DDTP	9000	2018-09-15	104
C205	DHN	20000	2018-08-01	101
C206	O LEVEL	18000	2018-07-25	105

WRITE SQL QUERIES

i) To Display the Trainer name, City from table Trainer.
A) SELECT TNAME, CITY from TRAINER;

ii) Display all details of table COURSE
A) SELECT * FROM COURSE;

iii) Display the Trainer Name, City & Salary in descending order of their Hiredate.
Ans:
SELECT TNAME, CITY, SALARY FROM TRAINER ORDER BY HIREDATE DESC;

iv) To display all the details of those trainers whose name ends with 'A'
A) select * from Trainer where Tname like '%A'

v) Display all details from the table COURSE in ascending order of their STARTDATE
Ans:
SELECT * FROM COURSE ORDER BY STARTDATE ASC;

vi) To display CName and Fees of those Courses Whose Fees range in between 10000-15000.
A) select CName, Fees from Course where Fees between 10000 and 15000;

vii) To display total salary of trainers from city name ends with "I".
A) SELECT SUM(SALARY) FROM TRAINER WHERE CNAME LIKE '%I';

viii) To display all Trainer Details from city "Mumbai"
Ans: SELECT * FROM TRAINER WHERE CITY = ' Mumbai ' ;

ix) To display CName, Fees and StartDate of all Courses which are started before 15th July 2018
Ans)
SELECT CNAME,FEES,STARTDATE FROM COURSE WHERE STARTDATE< ' 2018-07-15;

x) To display the last date (recent most) HIREDATE from the table TRAINER
Ans: SELECT MAX(HIREDATE) FROM TRAINER;

xi) To display the TNAME and CITY of Trainer who joined the Institute in the month of December 2001.
Ans:
SELECT TNAME, CITY FROM TRAINER WHERE HIREDATE BETWEEN '2001-12-01' AND '2001-12-31';

OR

SELECT TNAME, CITY FROM TRAINER WHERE HIREDATE >= '2001-12-01' AND HIREDATE<='2001-12-31';

OR

SELECT TNAME, CITY FROM TRAINER WHERE HIREDATE LIKE '2001-12%';

xii) To display TNAME, HIREDATE, CNAME, STARTDATE from tables TRAINER and COURSE of all those courses whose FEES is less than or equal to 10000.

Ans:

SELECT TNAME,HIREDATE,CNAME, STARTDATE FROM TRAINER, COURSE WHERE TRAINER.TID=COURSE.TID AND FEES<=10000;

xiii) To display CNAME, Fees, TName,City from tbales Trainer and Course of all those persons whose Hiredate Before Year 2000.

Ans) SELECT CNAME, FEES, TNAME, CITY from TRAINER, COURSE WHERE TRAINER.TID=COURSE.TID AND HIREDATE<'2000-01-01';

(XiV) To display number of Trainers from each city.

Ans)SELECT CITY,COUNT(*) FROM TRAINER;

WRITE SQL OUTPUTS

(a) SELECT TID, TNAME, FROM TRAINER WHERE CITY NOT IN('DELHI','MUMBAI');

Ans:

TID	TNAME
103	DEEPTI
106	MANIPRABHA

(b) SELECT DISTINCT TID FROM COURSE;

Ans:

DISTINCT TID
101
103
102
104
105

c) SELECT TID, COUNT(*), MIN(FEES) FROM COURSE GROUP BY TID HAVING COUNT(*)>1;

Ans:

TID	COUNT(*)	MIN(FEES)
101	2	12000

d) SELECT COUNT(*), SUM(FEES) FROM COURSE WHERE STARTDATE< '2018-09-15';

Ans:

COUNT(*)	SUM(FEES)
4	65000

(e) SELECT MIN(STARTDATE) FROM COURSE;

Ans)

MIN(STARTDATE)
2018-07-02

(f). SELECT MAX(STARTDATE), MIN(FEES) FROM COURSE;

A)

max(StartDate)	min(Fees)
2018-10-01	9000

(g) SELECT CITY, SUM(SALARY) FROM TRAINER GROUP BY CITY HAVING COUNT(*)>1 ;

A)

CITY	SUM(SALARY)
MUMBAI	18,5000
DELHI	15,8000

(h) select TNAME, CITY, SALARY from TRAINER T, COURSE C where T.TID!=C.TID;

A)

TNAME	CITY	SALARY
ManiPrabha	Chennai	69000

Note: 3 to 4 recent questions models are merged in the above question.

2.Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii), which are based on the tables (2016)

Table: VEHICLE

VCODE	VEHICLETYPE	PERKM
V01	VOLVO BUS	150
V02	AC DELUXE BUS	125
V03	ORDINARY BUS	80
V05	SUV	30
V04	CAR	18

Note: PERKM is Freight Charges per kilometer

Table: TRAVEL

CNO	CNAME	TRAVELDATE	KM	VCODE	NOP
101	K.Niwal	2015-12-13	200	V01	32
103	Fredrick Sym	2016-03-21	120	V03	45
105	Hitesh Jain	2016-04-23	450	V02	42
102	Ravi Anish	2016-01-13	80	V02	40
107	John Malina	2015-02-10	65	V04	2
104	Sahanubhuti	2016-01-28	90	V05	4
106	Ramesh Jaya	2016-04-06	100	V01	25

Note:

- Km is Kilometers travelled
- NOP is number of passengers travelled in vehicle

(i) To display CNO, CNAME, TRAVELDATE from the table TRAVEL in descending order of CNO.

Ans SELECT CNO, CNAME, TRAVELDATE FROM TRAVEL ORDER BY CNO DESC;

(ii) To display the CNAME of all the customers from the table TRAVEL who are traveling by vehicle with code V01 or V02.

Ans SELECT CNAME FROM TRAVEL WHERE VCODE='V01' OR VCODE='V02';

OR

SELECT CNAME FROM TRAVEL WHERE VCODE IN ('V01', 'V02');

(iii) To display the CNO and CNAME of those customers from the table TRAVEL who travelled between '2015-12-31' and '2015-05-01'.

Ans SELECT CNO, CNAME from TRAVEL WHERE TRAVELDATE >='2015-05-01' AND TRAVELDATE <= '2015-12-31';

OR

SELECT CNO, CNAME from TRAVEL WHERE TRAVELDATE BETWEEN '2015-05-01' AND '2015-12-31' ;

OR

SELECT CNO, CNAME from TRAVEL WHERE TRAVELDATE <= '2015-12-31' AND TRAVELDATE >= '2015-05-01' ;

OR

SELECT CNO, CNAME from TRAVEL WHERE TRAVELDATE BETWEEN '2015-12-31' AND '2015-05-01';

(iv) To display all the details from table TRAVEL for the customers, who have travel distance more than 120 KM in ascending order of NOP.

Ans SELECT * FROM TRAVEL
WHERE KM > 120 ORDER BY NOP;

(v) SELECT COUNT(*),VCODE FROM TRAVEL GROUP BY VCODE HAVING COUNT(*)>1;

Ans COUNT(*) VCODE
2 V01
2 V02

(vi) SELECT DISTINCT VCODE FROM TRAVEL;

Ans DISTINCT VCODE
V01
V02
V03
V04
V05

vii) SELECT A.VCODE,CNAME, VEHICLETYPE FROM TRAVEL A,VEHICLE B WHERE A.VCODE=B.VCODE AND KM<90;

Ans VCODE C NAME VEHICLETYPE
V02 Ravi Anish AC DELUXE BUS
V04 John Malina CAR

(viii) SELECT CNAME,KM*PERKM FROM TRAVEL A,VEHICLE B WHERE A.VCODE=B.VCODE AND A.VCODE='V05';

Ans CNAME KM*PERKM
Sahanubhuti 2700

3. Consider the following DEPT and EMPLOYEE tables. Write SQL queries for (i) to (iv) and find outputs for SQL queries (v) to (viii). (2015)

Table: DEPT

DCODE	DEPARTMENT	LOCATION
D01	INFRASTRUCTURE	DELHI
D02	MARKETING	DELHI
D03	MEDIA	MUMBAI
D05	FINANCE	KOLKATA
D04	HUMAN RESOURCE	MUMBAI

Table: EMPLOYEE

ENO	NAME	DOJ	DOB	GENDER	DCODE
1001	George K	2013-09-02	1991-09-01	MALE	D01
1002	Ryma Sen	2012-12-11	1990-12-15	FEMALE	D03
1003	Mohitesh	2013-02-03	1987-09-04	MALE	D05
1007	Anil Jha	2014-01-17	1984-10-19	MALE	D04
1004	Manila Sahai	2012-12-09	1986-11-14	FEMALE	D01
1005	R SAHAY	2013-11-18	1987-03-31	MALE	D02
1006	Jaya Priya	2014-06-09	1985-06-23	FEMALE	D05

Note: DOJ refers to date of joining and DOB refers to date of Birth of employees.

(i) To display Eno, Name, Gender from the table EMPLOYEE in ascending order of Eno.

Ans **SELECT Eno,Name,Gender FROM Employee ORDER BY Eno;**

(ii) To display the Name of all the MALE employees from the table EMPLOYEE.

Ans **SELECT Name FROM Employee WHERE Gender='MALE';**

(iii) To display the Eno and Name of those employees from the table EMPLOYEE w ho are born between '1987-01-01' and '1991-12-01'.

Ans **SELECT Eno,Name FROM Employee**
WHERE DOB BETWEEN '1987-01-01' AND '1991-12-01'
OR
SELECT Eno,Name FROM Employee
WHERE DOB >='1987-01-01' AND DOB <='1991-12-01' ;
OR
SELECT Eno,Name FROM Employee
WHERE DOB >'1987-01-01' AND DOB <'1991-12-01';

(iv) To count and display FEMALE employees who have joined after '1986-01-01'.

Ans **SELECT count(*) FROM Employee**
WHERE GENDER='FEMALE' AND DOJ > '1986-01-01';
OR
SELECT * FROM Employee
WHERE GENDER='FEMALE' AND DOJ > '1986-01-01';

(v) SELECT COUNT(*),DCODE FROM EMPLOYEE
GROUP BY DCODE HAVING COUNT(*)>1;

Ans **COUNT DCODE**
2 D01
2 D05

(vi) SELECT DISTINCT DEPARTMENT FROM DEPT;

Ans **Department**
INFRASTRUCTURE
MARKETING
MEDIA
FINANCE
HUMAN RESOURCE

(vii) SELECT NAME, DEPARTMENT FROM EMPLOYEE E, DEPT D WHERE E.DCODE=D.DCODE AND EN0<1003;

Ans **NAME DEPARTMENT**
George K INFRASTRUCTURE
Ryma Sen MEDIA

(viii) SELECT MAX(DOJ), MIN(DOB) FROM EMPLOYEE;

Ans **MAX(DOJ) MIN(DOB)**
2014-06-09 1984-10-19

4.Answer the question (b) and (c) on the basis of the following tables SHOPPE and ACCESSORIES. (2014)

Table: SHOPPE

ID	SName	Area
S01	ABC Computronics	CP
S02	All Infotech Media	GK II
S03	Tech Shopee	CP
S04	Geeks Techno Soft	Nehru Place
S05	Hitech Store	Nehru Place

Table: ACCESSORIES

ID	Iname	Price	Sno
A01	Mother Board	12000	S01
A02	Hard Disk	5000	S01
A03	Keyboard	500	S02
A04	Mouse	300	S01
A05	Mother Board	13000	S02
A06	Keyboard	400	S03
A07	LCD	6000	S04
A08	LCD	5500	S05
A09	Mouse	350	S05
A10	Harddisk	4500	S03

Write a SQL query (1 to 4) **4**

1. To display Name and Price of all the Accessories in ascending order of their Price.

A) Select Name, Price from ACCESSORIES order by Price.

2. To display Id and Sname of all Shopee located in Nehru Place;

A) Select Id, Sname from SHOPPE where Area = 'Nehru Place;

3. To display Minimum and Maximum price of each Name of Accessories.

A) Select Min(Price), Max(Price) from ACCESSORIES group by Name;

4. To display Name, Price of all the Accessories and their respective SName where they are available.

A) Select Name, Price, SName from SHOPPE, ACCESSORIES where SHOPPE.Id= ACCESSORIES.ID;

Write the output of the following SQL command (1 to 4) (2014) 2

1. SELECT DISTINCT NAME FROM ACCESSORIES WHERE PRICE>=5000;

INAME
Mother Board
Hard Disk
LCD

2.SELECT AREA, COUNT(*),FROM SHOPPE GROUP BY AREA;

AREA	Count(*)
CP	2
GK II	1
Nehru Place	2

3. SELECT COUNT(DISTINCT AREA) FROM SHOPPE;

COUNT(DISTINCT AREA)
3

4. SELECT NAME, PRICE*0.05 DISCOUNT FROM ACCESSORIES WHERE SNO IN('S02','S03');

INAME	DISCOUNT
Keyboard	25
Motherboard	650
Keyboard	20
Hard Disk	225

5.Write SQL queries for (b) to (g) and write the outputs for the SQL queries mentioned shown in (h1) to (h4) on basis of tables PRODUCTS and SUPPLIERS. (2013)

Table: PRODUCTS

PID	PNAME	QTY	PRICE	COMPANY	UPCODE
101	DIGITIAL CAMERA 14X	120	12000	RENIX	S01
102	DIGITAL PAD 11i	100	22000	DIGI POP	S02
104	PEN DRIVE 16 GB	500	1100	STOREKING	S01
106	LED SCREEN 32	70	28000	DISPEX PERTS	S02
105	CAR GPS SYSTEM	60	12000	MOVEON	S03

Table: SUPPLIERS

SUPCODE	SNAME	CITY
S01	GET ALL INC	KOLKATA
S03	EASY MARKET CORP	DELHI
S02	DIGI BUSY GROUP	CHENNAI

(b) To display the details of all the products in ascending order of product names (ie PNAME)

A) SELECT * FROM PRODUCTS ORDER BY PNAME;

(c) To display product name and price of all those products whose price is in range of 10000 and 15000 (both values inclusive).

A) SELECT PNAME, PRICE FROM PRODUCTS WHERE PRICE >=10000 AND PRICE >=15000;

(d) To display the number of products, which are supplied supplier. Ie, the expected output should be

S01 2
S02 2
S03 1

A) SELECT SUPCODE, COUNT(SUPCODE) FROM PRODUCTS GROUP BY SUPCODE;

(E) To display the price, product name and quantity (ie qty) of those products which have quantity more than 100

A) SELECT PRICE,PNAME, QTY FROM PRODUCTS WHERE QTY>100;

(f) To display the names of those suppliers, who are either from DELHI or from CHENNAI.

A) SELECT SNAME FROM SUPPLIERS WHERE CITY="DELHI" OR CITY="KOLKATA";

(g) To display the name of the companies and the name of the products in descending order of company names.

A) SELECT COMPANY, PNAME FROM PRODUCTS ORDER BY COMPANY DESC.

(h) Obtain the outputs of the following SQL queries based on the data given in tables PRODUCTS and SUPPLIERS above.

(h1) SELECT DISTINCT SUPCODE FROM PRODUCTS;

A)

SUPCODE
S01
S02
S03

(h2) SELECT MAX(PRICE), MIN(PRICE) FROM PRODUCTS;

A)

MAX (PRICE)	MIN(PRICE)
28000	1100

(h3) SELECT PRICE*QTY AMOUNT FROM PRODUCTS WHERE PID=104;

A)

AMOUNT
55000

(h4) SELECT PNAME, SNAME FROM PRODUCTS P, SUPPLIERS S WHERE P.SUPCODE=S.SUPCODE AND QTY>100;

PNAME	SNAME
DIGITAL CAMERA 14X	GET ALL INC
PEN DRIVE 16GB	GET ALL INC

6) Constider the following tables CARDEN and CUSTOMER and answer (b) and (c) parts of this question: (2012)

Table: CARDEN

Ccode	CarName	Make	Color	Capacity	Charge
501	A-Star	Suzuki	RED	3	14
503	Indigo	Tata	SILVER	3	12
502	Innova	Tovota	WHITE	7	15
509	SX4	Suzuki	SILVER	4	14
510	C Class	Mercedes	RED	4	35

Table: CUSTOMER

CCode	Cname	Ccode
1001	Hemant Sahu	501
1002	Raj Lal	509
1003	Feroza Shah	503
1004	Ketan Dhal	502

(b) Write SQL commands for the following statements: 4

(i) To display the names of all silver colored Cars.

Ans **SELECT CarName FROM CARDEN WHER Color = 'SILVER';**

(ii) To display name of car, make and capacity of cars in descending order of their sitting capacity.

Ans **SELECT CarName, Make, Capacity FROM CARDEN ORDER BY Capacity DESC;**

(iii) To display the highest charges at which a vehicle can be hired from CARDEN.

Ans **SELECT MAX(Charges) FROM CARDEN ;**

OR

SELECT CarName, MAX(Charges)FROM CARDEN GROUP BY CarName;

(iv) To display the customer name and the corresponding name of the cars hired by them.

Ans SELECT **CName, CarName FROM CUSTOMER, CARDEN WHERE CUSTOMER.Ccode = CARDEN.Ccode;** **OR**

SELECT CUSTOMER. CName, CARDEN. CarName FROM CUSTOMER, CARDEN WHERE CUSTOMER.Ccode = CARDEN.Ccode;

OR

SELECT CName, CarName FROM CUSTOMER A, CARDEN B WHERE A.Ccode = B.Ccode;

OR

SELECT A. CName, B. CarName FROM CUSTOMER A, CARDEN B WHERE A.Ccode = B.Ccode;

(c) Give the output of the following SOL queries:

(i) SELECT COUNT (DISTINCT Make) FROM CARDEN;

Ans

COUNT (DISTINCT Make)
4

(ii) SELECT MAX (Charges), MIN (Charges) FROM CARDEN;

Ans

MAX (Charges)	MIN (Charges)
35	12

(iii) SELECT COUNT (*), Make FROM CARDEN;

Ans (Ignoring Make for display)

COUNT (*)
5

OR

(assuming the presence of GROUP By Make)

COUNT(*)	Make
2	SUZUKJ:
1	TATA
1	TOYOTA
1	MERCEDES

(iv) SELECT CarName FROM CARDEN WHE~ Capacity = 4;

Ans

CarName
Sx4
C Class

7) Consider the following tables EMPLOYEE and SALGRADE and answer (b) and (c) parts of this questions. (2011)

Table: EMPLOYEE

ECODE	NAME	DESIG	SGRADE	DOJ	DOB
101	Abdul Ahmad	EXECUTIVE	S03	23-Mar-2003	13-Jan-1980
102	Ravi. Chander	HEAD-IT	S02	12-Feb-2010	22-Jul-1987
103	John Ken	RECEPTIONIST	S03	24-June-2009	24-Feb-1983
105	Nazar Ameen	GM	S02	11-Aug-2006	03-Mar-1984
108	Priyam Sen	CEO	S01	29-Dec-2004	19-Jan-1982

Table: SALGRADE

SGRADE	SALARY	HRA
S01	56000	18000
S02	32000	12000
S03	24000	8000

(b) Write SQL commands for the following statements:

(i) To display the details of all EMPLOYEEs, in descending order of DOJ

Ans **SELECT * FROM EMPLOYEE ORDER BY DOJ DESC;**

(ii) To display NAME and DE51G of those EMPLOYEEs, whose 5ALGRADE is either 502 or 503

Ans **SELECT NAME, DESIG FROM EMPLOYEE WHERE SGRADE = 'S02' OR SGRADE= 'S03';**

OR

SELECT NAME, DESIG FROM EMPLOYEE WHERE SALGRADE ='S02' OR SALGRADE='S03';

(iii) To display the content of all the EMPLOYEEs table, whose DOJ is in between'09-Feb-2006' and '08-Aug-2009'.

Ans **SELECT * FROM EMPLOYEE WHERE DOJ BETWEEN '09-Feb-2006'and '08-Aug-2009';** **OR**

SELECT * FROM EMPLOYEE WHERE DOJ > = '09-Fab-2006' and DOJ <='08-Aug-2009';

OR

SELECT * FROM EMPLOYEE WHERE DOJ > '09-Feb-2006' and DOJ <' 08-Aug-2009" ;

(iv) To add a new row with the following:

109, 'Harish Roy', 'HEAD-IT', 'S02', '09-Sep-2007, '21-Apr-1983'

Ans **INSERT INTO EMPLOYEE VALUES(109,'Harish Roy' ,'HEAD-IT' ,'S02' ,'09-Sep-2007' ,'21-Apr-1983') ;**

(c) Give :the output of the following SQL queries: 2

(i) SELECT COUNT (SGRADE),SGRADE FROM EMPLOYEE GROUP BY SGRADE;

Ans **COUNT (SGRADE) SGRADE**
1 S01
2 S02
2 S03

(ii) SELECT MIN(DOB), MAX (DOJ) FROM EMPLOYEE;
Ans **MIN (DOB) MAX (DOJ)**
13-Jan-1980 12-Feb-2010

(iii) SELECT NAME , SALARYFROM EMPLOYEE E, SALGRADE S WHERE
E.SGRADE= S.SGRADE AND E.ECODE<103;
Ans **Name Salary**
Abdul Ahmad 24000
Ravi Chander 32000

(iv) SELECT SGRADE, SALARY+HRA ET:)M SALGRADE WHERE SGRADE= 'S02';
Ans **SGRADE SALARY+HRA**
S02 44000

8) Consider the following tables STORE and SUPPLIERS and answer (bl) and (b2) parts of this question: (D 2010)

Table: STORE

ItemNo	Item	Scode	Qty	Rate	LastBuy
2005	Sharpener Classic	23	60	8	31-Jun-09
2003	Ball Pen 0.25	22	50	25	01-Feb-10
2002	Gel Pen Premium	21	150	12	24-Feb-10
2006	Gel Pen Classic	21	250	20	11-Mar-09
2001	Eraser Small	22	220	6	19-Jan-09
2004	Eraser Big	22	110	8	02-Dec-09
2009	Ball Pen 0.5	21	180	18	03-Nov-09

Table: SUPPLIERS

Scode	Sname
21	Premium Stationers
23	Soft Plastics
22	Tetra Supply

b1)Write SQL commands for the following statements:4 (i) To display details of all the items in the Store table in ascending order of LastBuy.
Ans. SELECT * FROM STORE ORDER BY LastBuy;
(ii) To display ItemNo and Item name of those items from Store table whose Rate is more than 15 Rupees.
Ans. SELECT ItemNo, Item..In FROM STORE WHERE Rate >15;
(iii) To display the details of those items whose Supplier code (Scode) is 22 or Quantity in Store (Qty) is more than 110 from the table Store.
Ans. SELECT * FROM STORE WHERE Scode = 22 OR Qty >110;
(iv) To display Minimum Rate of items for each Supplier individually as per Scode from the table Store.
Ans. SELECT Scode, MIN(Rate) FROM STORE GROUP BY Scode;

b2)Give the output of the following SQL queries:2
Note: In all output Questions ignore Column Headings
(i) SELECT COUNT(DISTINCT Scode) FROM Store;
Ans. COUNT(DISTINCT Scode)
3
(ii) SELECT Rate*Qty FROM Store WHERE ItemNo=2004;
Ans. RATE*QTY
880
(iii) SELECT Item,Sname FROM Store S, Suppliers P WHERE S.Scode=P.Scode AND ItemNo=2006;
Ans. ITEM SNAME Gel Pen Classic Premium Stationers
(iv) SELECT MAX(LastBuy) FROM Store;
Ans. MAX (LASTBUY)
24-Feb-10

9) Consider the following tables GARMENT and FABRIC. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii) (D2009)6

Table: GARMENT

GCODE	DESCRIPTION	PRICE	FCODE	READYDATE
10023	PENCIL SKIRT	1150	F03	19-DEC-08
10001	FORMAL SHIRT	1250	F01	12-JAN-08
10012	INFORMAL SHIRT	1550	F02	06-JUN-08
10024	BABY TOP	750	F03	07-APR-07
10090	TULIP SKIRT	850	F02	31-MAR-07
10019	EVENING GOWN	850	F03	06-JUN-08
10009	INFORMAL PANT	1500	F02	20-OCT-08
10007	FORMAL PANT	1350	F01	09-MAR-08
10020	FROCK	850	F04	09-SEP-07
10089	SLACKS	750	F03	20-OCT-08

Table : FABRIC

FCODE	TYPE
F04	POLYSTER
F02	COTTON
F03	SILK
F01	TERELENE

(i) To display GCODE and DESCRIPTION of each GARMENT in descending order of GCODE
Ans SELECT GeODE, DESCRIPTION FROM GARMENT ORDER BY GCODE DESC;
(ii) To display the details of all the GARMENTs, which have READYDA TE in between 08-DEC-07 and 16-JUN-08(inclusive of both the dates).
Ans) SELECT * FROM GARMENT WHERE READYDATE BETWEEN' 08-DEC-07'AND , 16-JUN-08' ; OR
SELECT * FROM DRESS WHERE LAUNCHDATE >= '08-DEC-07' AND LAUNCHDATE<='16-JUN-08';
(iii) To display the average PRICE of all the GARMENTs, which are made up of FABRIC with FCODE as F03.
Ans) SELECT AVG (PRICE) FROM GARMENT WHERE FCODE = 'F03';

(iv) To display FABRIC wise highest and lowest price of GARMENTs from GARMENT table. (Display FCODE of each GARMENT along with highest and lowest price)

Ans SELECT FCODE, MAX (PRICE), MIN(PRICE) FROM GARMENT GROUP BY FCODE;

(v) SELECT SUM (PRICE) FROM GARMENT WHERE FCODE = 'F01' ;

Ans SUM (PRICE)
2600

(vi) SELECT DESCRIPTION, TYPE FROM GARMENT, FABRIC WHERE GARMENT.FCODE = FABRIC.FCODE AND GARMENT. PRICE > = 1260 ;

Ans) DESCRIPTION TYPE
INFORMAL SHIRT COTTON
INFORMAL PANT COTTON
FORMAL PANT TERELENE

(vii) SELECT MAX (FCODE) FROM FABRIC;

Ans MAX (FCODE)
F04

(viii) SELECT COUNT (DISTINCT PRICE) FROM GARMENT ;

Ans COUNT(DISTINCT PRICE)
7

(10) Consider the following tables DRESS and MATERIAL. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii). (2009 OD) 6

Table: DRESS

DCODE	DESCRIPTION	PRICE	MCODE	LAUNCHDATE
10001	FORMAL SHIRT	1250	M001	12-JAN-08
10020	FROCK	750	M004	09-SEP-07
10012	INFORMAL SHIRT	1450	M002	06-JUN-08
10019	EVENING GOWN	850	M003	06-JUN-08
10090	TULIP SKIRT	850	M002	31-MAR-07
10023	PENCIL SKIRT	1250	M003	19-DEC-08
10089	SLACKS	850	M003	20-OCT-08
10007	FORMAL PANT	1450	M001	09-MAR-08
10009	INFORMAL PANT	1400	M002	20-OCT-08
10024	BABY TOP	650	M003	07-APR-07

Table: MATERIAL

MCODE	TYPE
MOO1	TERELENE
MOO2	COTTON
MOO4	POLYESTER
MOO3	SILK

(i) To display DCODE and DESCRIPTION of each dress in ascending order of DCODE.

Ans SELECT DCODE. DESCRIPTION FROM DRESS ORDER BY DCODE ;

(ii) To display the details of all the dresses which have LAUNCHDATE in between 05-DEC'-07 and 20-JUN-08 (inclusive of both the dates).

Ans SELECT * FROM DRESS WHERE LAUNCHDATE BETWEEN '05-DEC-07' AND '20-JUN-08' OR
SELECT * FROM DRESS WHERE LAUNCHDATE >= '05-DEC-07' AND LAUNCHDATE<= '20-JUN-08'

(iii) To display the average PRICE of all the dresses which are made up of material with MCODE as M003.

Ans SELECT AVG(PRICE) FROM GARMENT WHERE MCODE = 'M003'

(iv) To display materialwise highest and lowest price of dresses from DRESS table. (Display MCODE of each dress along with highest and lowest price)

Ans SELECT MCODE, MAX(PRICE), MIN (PRICE) FROM DRESS GROUP BY MCODE

(v) SELECT SUM(PRICE) FROM DRESS WHERE MCODE='M001';

Ans SUM(PRICE)
2700

(vi) SELECT DESCRIPTION, TYPE FROM DRESS, MATERIAL WHERE DRESS.DCODE = MATERIAL.MCODE AND DRESS.PRICE>=l250;

Ans DESCRIPTION TYPE
(NO OUTPUT)

(vii) SELECT MAX(MCODE) FROM MATERIAL;

Ans MAX (MCODE)
MOO4

(viii) SELECT COUNT(DISTINCT PRICE) FROM DRESS;

Ans COUNT(DISTINCT PRICE)
6

11) Consider the following tables Product and Client. Write SQL commands for the statement (i) to (iv) and give outputs for SQL queries (v) to (viii) (D 2008)

Table: **PRODUCT**

P_ID	Product Name	Manufacturer	Price
TP01	Talcom Powder	LAK	40
FW05	Face Wash	ABC	45
BS01	Bath Soap	ABC	55
SH06	Shampoo	XYZ	120
FW12	Face Wash	XYZ	95

Table: **CLIENT**

C_ID	Client Name	City	P_ID
01	Cosmetic Shop	Delhi	FW05
06	Total Health	Mumbai	BS01
12	Live Life	Delhi	SH06
15	Pretty Woman	Delhi	FW12
16	Dreams	Banglore	TP01

(i) To display the details of those Clients whose city is Delhi.

Ans: Select all from Client where City="Delhi"

(ii) To display the details of Products whose Price is in the range of 50 to 100 (Both values included).

Ans: Select all from product where Price between 50 and 100

(iii) To display the ClientName, City from table Client, and ProductName and Price from table Product, with their corresponding matching P_ID.

Ans: Select ClientName,City, ProductName, Price from Product,Client where Product.P_ID= Client.P_ID.

(iv) To increase the Price of all Products by 10

Ans: Update Product Set Price=Price +10

(v)SELECT DISTINCT Address FROM Client.
Ans: (The above question may consist DISTINCT City. If it is DISTINCT City, the following is the answer)

City

Delhi
Mumbai
Bangalore

(vi)SELECT Manufacturer, MAX(Price), Min(Price), Count(*) FROM Product GROUP BY Manufacturer;
Ans:

Manufacturer	Max(Price)	Min(Price)	Count(*)
LAK	40	40	1
ABC	55	45	2
XYZ	120	95	2

(vii)SELECT ClientName, ManufacturerName FROM Product, Client WHERE Client.Prod_Id=Product.P_Id;
Ans:

ClientName	ManufacturerName
Cosmetic Shop	ABC
Total Health	ABC
Live Life	XYZ
Pretty Woman	XYZ
Dreams	LAK

(viii)SELECT ProductName, Price * 4 FROM Product.

ProductName	Price*4
Talcom Poweder	160
Face Wash	180
Bath Soap	220
Shampoo	480
Face Wash	380

12) Consider the following tables Item and Customer. Write SQL commands for the statement (i) to (iv) and give outputs for SQL queries (v) to (viii) (OD 2008)

Table: **ITEM**

I_ID	Item Name	Manufacturer	Price
PC01	Personal Computer	ABC	35000
LC05	Laptop	ABC	55000
PC03	Personal Computer	XYZ	32000
PC06	Personal Computer	COMP	37000
LC03	Laptop	PQR	57000

Table: **CUSTOMER**

C_ID	Customer Name	City	I_ID
01	N.Roy	Delhi	LC03
06	H.Singh	Mumbai	PC03
12	R.Pandey	Delhi	PC06
15	C.Sharma	Delhi	LC03
16	K.Agarwal	Banglore	PC01

(i) To display the details of those Customers whose city is Delhi.
Ans: SELECT ALL FROM CUSTOMER WHERE CITY="DELHI"
(ii) To display the details of Item whose Price is in the range of 35000 to 55000 (Both values included).
Ans: SELECT ALL FROM ITEM WHERE PRICE>=35000 AND PRICE <=55000
(iii) To display the CustomerName, City from table Customer, and ItemName and Price from table Item, with their corresponding matching I_ID.
Ans: SELECT CUSTOMERNAME,CITY, ITEMNAME, PRICE FROM ITEM,CUSTOMER WHERE ITEM.I_ID=CUSTOMER.I_ID.
(iv) To increase the Price of all Items by 1000 in the table Item.
Ans: UPDATE ITEM SET PRICE=PRICE+1000

(v)SELECT DISTINCT City FROM Customer.
Ans:

City
Delhi
Mumbai
Bangalore

(vi)SELECT ItemName, MAX(Price), Count(*) FROM Item GROUP BY ItemName;
Ans:

ItemName	Max(Price)	Count(*)
Personal Computer	37000	3
Laptop	57000	2

(vii)SELECT CustomerName, Manufacturer FROM Item, Customer WHERE Item.Item_Id=Customer.Item_Id;
Ans:

CustomerName	ManufacturerName
N.Roy	PQR
H.Singh	XYZ
R.Pandey	COMP
C.Sharma	PQR
K.Agarwal	ABC

(viii)SELECT ItemName, Price * 100 FROM Item WHERE Manufacturer = 'ABC';
Ans:

ItemName	Price*100
Personal Computer	3500000
Laptop	5500000

13) Consider the following tables Consignor and Consignee. Write SQL command for the statements(i)to(iv) And give outputs for the SQL quries (v) to (viii). (OD2007) 6

TABLE : **CONSIGNOR**

CnorID	CnorName	CnorAddress	City
ND01	R singhal	24,ABC Enclave	New Delhi
ND02	Amit Kumar	123,Palm Avenue	New Delhi
MU15	R Kohil	5/A,South,Street	Mumbai
MU50	S Kaur	27-K,Westend	Mumbai

TABLE : **CONSIGNEE**

CneeID	CnorID	CneeName	CneeAddress	CneeCity
MU05	ND01	Rahul Kishore	5,Park Avenue	Mumbai
ND08	ND02	P Dhingra	16/j,Moore Enclave	New Delhi
KO19	MU15	A P Roy	2A,Central/avenue	Kolkata
MU32	ND02	S mittal	P 245, AB Colony	Mumbai
ND48	MU50	B P jain	13,Blockd,a,viha	New Delhi

(i) To display the names of all consignors from Mumbai.
Ans: SELECT CNORNAME FROM CONSIGNOR WHERE CITY="MUMBAI";
(ii) To display the cneeID, cnorName, cnorAddress, CneeName, CneeAddress for every Consignee.

Ans: SELECT CNEEID, CNORNAME, CNORADDRESS, CNEENAME, CNEEADDRESS FROM CONSIGNOR,CONSIGNEE WHERE CONSIGNOR.CNORID=CONSIGNEE.CNORID;

(iii) To display the consignee details in ascending order of CneeName.

Ans: SELECT * FROM CONSIGNEE ORDERBY CNEENAME ASC;

(iv) To display number of consignors from each city.

Ans: SELECT CITY, COUNT(*) FROM CONSIGNORS GROUP BY CITY;

(v)SELECT DISTINCT City FROM CONSIGNEE;

Ans: CneeCity
Mumbai
New Delhi
Kolkata

(vi) SELECT A.CnorName A, B.CneeName B FROM Consignor A, Consignee B WHERE A.CnorID=B.CnorID AND B.CneeCity='Mumbai';

Ans)

CnorName
R singhal
Amit Kumar

CneeName
Rahul Kishore
S mittal

(vii)SELECT CneeName,CneeAddress FROM Consignee WHERE CneeCity Not IN ('Mumbai', 'Kolkata');

Ans:

CneeName	CneeAddress
P Dhingra	16/J,Moore Enclave
B P Jain	13,Block D,A Vihar

(viii) SELECT CneeID, CneeName FROM Consignee WHERE CnorID = 'MU15' OR CnorID = 'ND01';

Ans:

CneeID	CneeName
MU05	Rahul Kishore
KO19	A P Roy

14)Consider the following tables. Write SQL command for the statements (i)to(iv)and give outputs for the SQL quries (v) to (viii). (D2006) 6

TABLE : **SENDER**

SenderID	SenderName	Sender Address	Sender City
ND01	R jain	2,ABC Appts	New Delhi
MU02	H sinha	12, Newton	Mumbai
MU15	S haj	27/ A,Park Street	New Delhi
ND50	T Prasad	122-K,SDA	Mumbai

TABLE :**RECIPIENT**

RecID	Sender ID	ReCName	RecAddress	ReCCity
KO05	ND01	R Bajpayee	5,Central Avenue	Kolkata
ND08	MU02	S Mahajan	116, A Vihar	New Delhi
MU19	ND01	H sing	2A,Andheri East	Mumbai
MU32	MU15	P K swamy	B5, CS Terminus	Mumbai
ND48	ND50	S Tripathi	13, B1 D,Mayur Vihar	New Delhi

(i) To display the names of all senders from Mumbai.

Ans:SELECT * FROM SENDER WHERE SENDERCITY='MUMBAI';

(ii) To display the recID, senderName, senderAddress, RecName, RecAddress for every recipt.

Ans: SELECT RECID, SENDERNAME, SENDERADDRESS, RECNAME, RECADDRESS FROM SENDER, RECIPIENT WHERE SENDER.SENDERID=RECIPIENT.RENDERID;

(iii) To display the sender details in ascending order of SenderName.

Ans: SELECT * FROM SENDER ORDER BY SENDERNAME;

(iv) To display number of Recipients from each city.

Ans: SELECT RECCITY,COUNT(*) FROM RECIPIENT GROUP BY RECCITY;

(v) SELECT DISTINCT SenderCity FROM Sender;

Ans: DISTINCT(SENDERCITY)

NewDelhi

Mumbai

(vi) SELECT A.SenderName A, B.RecName FROM Sender A, Recipient B WHERE A.SenderID=B. SenderID AND B.RecCity='Mumbai';

Ans:

SenderName	RecName
R.Jain	H.Singh
S.Jha	P.K.Swamy

(vii)SELECT RecName,RecAddress FROM Recipient WHERE RecCity Not IN ('Mumbai', Kolkata');

Ans:

RecName	RecAddress
S Mahajan	116, A Vihar
S Tripati	13, B1 D, Mayur Vihar

(viii) SELECT RecID, RecName FROM Recipient WHERE SenderID = 'MU02' OR SenderID = 'ND50';

Ans:

RecID	RecName
ND08	S Mahajan
ND48	S Tripathi

15) Study the following tables FLIGHTS and FARES and write SQL commands for the questions (i) to (iv) and give outputs for SQL quires (v) to(vi). (OD 2006)

TABLE: **FLIGHTS**

FL_NO	STARTING	ENDING	NO_ FLIGHTS	NO_ STOPS
IC301	MUMBAI	DELHI	8	0
IC799	BANGALORE	DELHI	2	1
MC101	INDORE	MUMBAI	3	0
IC302	DELHI	MUMBAI	8	0
AM812	KANPUR	BANGLORE	3	1
IC899	MUMBAI	KOCHI	1	4
AM501	DELHI	TRIVENDRUM	1	5
MU499	MUMBAI	MADRAS	3	3
IC701	DELHI	AHMEDABAD	4	0

TABLE:**FARES**

FL_NO	AIRLINES	FARE	TAX%
IC701	INDIAN AIRLINES	6500	10
MU499	SAHARA	9400	5
AM501	JET AIRWAYS	13450	8
IC899	INDIAN AIRLINES	8300	4
IC302	INDIAN AIRLINES	4300	10
IC799	INDIAN AIRLINES	1050	10
MC101	DECCAN AIRLINES	3500	4

(i) Display FL_NO and NO_FLIGHTS from "KANPUR" TO "BANGALORE" from the table FLIGHTS.

Ans: SELECT FL_NO, NO_FLIGHTS FROM FLIGHTS WHERE STARTING="KANPUR" AND ENDING="BANGALORE"

(ii) Arrange the contents of the table FLIGHTS in the ascending order of FL_NO.

Ans: SELECT * FROM FLIGHTS ORDER BY FL_NO;

(iii) Display the FL_NO and fare to be paid for the flights from DELHI to MUMBAI using the tables FLIGHTS and FARES, where the fare to be paid = FARE+FARE+TAX%/100.

Ans: SELECT FL_NO, FARE+FARE+(TAX%/100) FROM FLIGHTS, FARES WHERE STARTING="DELHI" AND ENDING="MUMBAI"

(iv) Display the minimum fare "Indian Airlines" is offering from the tables FARES.

Ans: SELECT MIN(FARE) FROM FARES WHERE AIRLINES="INDIAN AIRLINES"

v)Select FL_NO,NO_FLIGHTS, AIRLINES from FLIGHTS, FARES Where STARTING = "DELHI" AND FLIGHTS.FL_NO = FARES.FL_NO

Ans:

FL_NO	NO_FLIGHTS	AIRLINES
IC302	8	Indian Airlines
AM501	1	Jet Airways
IC701	4	Indian Airlines

(vi) SELECT count (distinct ENDING) from FLIGHTS.

Ans: 7

16) Study the following tables DOCTOR and SALARY and write SQL commands for the questions (i) to (iv) and give outputs for SQL queries (v) to (vi) (D2006):

TABLE: DOCTOR

ID	NAME	DEPT	SEX	EXPERIENCE
101	Johan	ENT	M	12
104	Smith	ORTHOPEDIC	M	5
107	George	CARDIOLOGY	M	10
114	Lara	SKIN	F	3
109	K George	MEDICINE	F	9
105	Johnson	ORTHOPEDIC	M	10
117	Lucy	ENT	F	3
111	Bill	MEDICINE	F	12
130	Murphy	ORTHOPEDIC	M	15

TABLE: SALARY

ID	BASIC	ALLOWANCE	CONSULTAION
101	12000	1000	300
104	23000	2300	500
107	32000	4000	500
114	12000	5200	100
109	42000	1700	200
105	18900	1690	300
130	21700	2600	300

(i) Display NAME of all doctors who are in "MEDICINE" having more than 10 years experience from the Table DOCTOR.

Ans: SELECT NAME FROM DOCTOR WHERE DEPT="MEDICINE" AND EXPERIENCE>10

(ii) Display the average salary of all doctors working in "ENT"department using the tables DOCTORS and SALARY Salary =BASIC+ALLOWANCE.

Ans: SELECT AVG(BASIC+ALLOWANCE) FROM DOCTOR,SALARY WHERE DEPT="ENT" AND DOCTOR.ID=SALARY.ID

(iii) Display the minimum ALLOWANCE of female doctors.

Ans: SELECT MIN(ALLOWANCE) FROM DOCTRO,SALARY WHERE SEX="F" AND DOCTOR.ID=SALARY.ID

(iv) Display the highest consultation fee among all male doctors.

Ans: SELECT MAX(CONSULATION) FROM DOCTOR,SALARY WHERE SEX="M" AND DOCTOR.ID=SALARY.ID

(v) SELECT count (*) from DOCTOR where SEX = "F"

Ans: 4

(vi) SELECT NAME, DEPT , BASIC from DOCTOR, SALRY Where DEPT = "ENT" AND DOCTOR.ID = SALARY.ID

Ans:

Name	Dept	Basic
Jonah	Ent	12000

17) Consider the following tables EMPLOYEES and EMPSALARY. write SQL commands for the Statements (i) to (iv) and give outputs for SQL quires (v) to (viii).(D2005)

EMPLOYEES

EMPID	FIRSTNAME	LASTNAME	ADDRESS	CITY
010	GEORGE	Smith	83 First Street	Howard
105	MARY	Jones	842VineAve	Losantiville
152	SAM	Tones	33 Elm st	Paris
215	SARAH	Ackerman	440 U.S.110	Upton
244	MANILA	Sengupta	24 Friends Street	New Delhi
300	ROBERT	Samuel	9 Fifth Cross	Washington
335	HENRY	Williams	12 Moore Street	Boston
400	RACHEL	Lee	121 Harrison	New York
441	PETER	Thompson	11 Red road	Paris

EMPSALRAY

EMPID	SALARY	BENEFITS	DESIGNATION
010	75000	15000	Manager
105	65000	15000	Manager
152	80000	25000	Director
215	75000	12500	Manager
244	50000	12000	Clerk
300	45000	10000	Clerk
335	40000	10000	Clerk
400	32000	7500	Salesman
441	28000	7500	Salesman

(i) To display Firstname, Lastname, Address and City of all employees living in Paris from the table EMPLOYEES.

Ans: SELECT FIRSTNAME, LASTNAME, ADDRESS,CITY FROM EMPLOYEES WHERE CITY="PARIS"

(ii) To display the content of EMPLOYEES table in descending order of FIRSTNAME.

Ans: SELECT * FROM EMPLOYEES ORDER BY FIRSTNAME DESC

(iii) To display the Firstname, Lastname, and Total Salary of all managers from the tables, where Total Salary is calculated as Salary+Benifts.

Ans: SELECT FIRSTNAME, LASTNAME, SALARY+BENEFITS FROM EMPLOYEES, EMPSALARY WHERE DESIGNATION =

"MANAGER" AND EMPLOYEES.EMPID =EMPSALARY.EMPID

(iv) To display the Maximum salary among Managers and Clerks from the table EMPSALARY.

Ans: SELECT DESIGNATION,MAX(SALARY) FROM EMPSALARY WHERE DESIGNATION="MANAGER" OR DESIGNATION="CLERK"

(v) SELECT FIRSTNAME,SALARY FROM EMPLOYEES,EMPSALARY WHERE DESTINATION ='Salesman' AND EMPOLYEES.EMPID=EMPSALARY.EMPID;

Ans:

Firstname	**Salary**
Rachel	32000
Peter	28000

(vi) SELECT COUNT (DISTINT DESIGNATION) FROM EMPSALARY

Ans: 4

(vii) SELECT DESIGNATION , SUM(SALARY) FROM EMPSALARY GROUP BY DESIGNATION HAVING COUNT(*)>2;

Ans:

Designation	**Sum(Salary)**
Manager	215000
Clerk	135000

(viii)SELECT SUM (BENEFITS) FROM EMPSALARY WHERE DESIGNATION='Clerk';

Ans: 32000

18) Consider the following tables WORKERS and DESIG. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii).(OD 2005)

WORKERS

W_ID	FIRST NAME	LASTNAME	ADDRESS	CITY
102	Sam	Tones	33 Elm St.	Paris
105	Sarah	Ackerman	44 U.S.110	New York
144	Manila	Sengupta	24 Friends Street	New Delhi
210	George	Smith	83 First Street	Howard
255	Mary	Jones	842 Vine Ave.	Losantiville
300	Robert	Samuel	9 Fifth Cross	Washington
335	Henry	Williams	12 Moore Street	Boston
403	Ronny	Lee	121 Harrison St.	New York
451	Pat	Thompson	11 Red Road	Paris

DESIG

W_ID	SALARY	BENEFITS	DESIGINATION
102	75000	15000	Manager
105	85000	25000	Director
144	70000	15000	Manager
210	75000	12500	Manager
255	50000	12000	Clerk
300	45000	10000	Clerk
335	40000	10000	Clerk
400	32000	7500	Salesman
451	28000	7500	Salesman

(i) To display W_ID Firstname, address and City of all employees living in New York from the Table WORKERs

Ans: SELECT W_ID , FIRSTNAME,ADDRESS, CITY FROM WORKERS WHERE CITY="NEW YORK"

(ii) To display the content of workers table in ascending order of LASTNAME.

Ans:**SELECT * FROM WORKER ORDER BY LASTNAME ASC**

(iii) To display the FIRSTNAME, LASTNAME and Total Salary of all Clerks from the tables WORKERS And DESIG, where Total
salary is calculated as Salary + benifts.

Ans: SELECT FIRSTNAME, LASTNAME, SALARY+BENEFITS WHERE WORKER.W_ID= DESG.W_ID AND DESIGNATION="CLERK"

(iv) To display the minimum salary among managers and Clerks from the tables DESIG.

Ans:

SELECT MIN(SALARY), DESIGNATION FROM DESIG WHERE DESIGNATION IN ('MANAGER'.'CLERK') GROUP BY DESIGNATION;

OR

SELECT MIN(SALARY), DESIGNATION FROM DESIG WHERE DESIGNATION= 'MANAGER' OR DESIGNATION='CLERK' GROUP BY DESIGNATION;

OR

SELECT MIN(SALARY) FROM DESIG WHERE DESIGNATION='MANAGER' OR DESIGNATION='CLERK';

OR

SELECT MIN(SALARY) FROM DESIG WHERE DESIGNATION IN ('MANAGER','CLERK');

(v) SELECT FIRSTNAME, SALARY FROM WORKERS, DESIG WHERE DESIGINATION = "MANAGER" AND WORKERS.W_ID = DESIGN.W_ID

Ans:

FIRSTNAME	**SALARY**
Sam	75000
Manila	70000
George	75000

(vi)SELECT COUNT(DISTINCT DESIGNATION) FROM DESIGN ;

Ans: **4**

(vii) SELECT DESIGNATION, SUM(SALARY) FROM DESIG GROUP BY DESIGNATION HAVING COUNT (*) < 3;

Ans:

Designation	**Sum(Salary)**
Director	85000
Salesman	60000

(viii) SELECT SUM(BENIFTS) FROM DESIG WHERE DESIGINATION="salesman";

Ans: 15000

19. Give the following table for database a LIBRARY. (2004)

TABLE : BOOKS

BOOK_ID	BOOK_NAME	AUTHORNAME	PUBLISHER	PRICE	TYPE	QUANTITY
F0001	The Tears	William Hopkins	First Publ.	750	Fiction	10
F0002	Thunder bolts	Anna Roberts	First Publ.	700	Fiction	5
T0001	My first C++	Brains & Brooke	EPB	250	Text	10
T0002	C++ Brain works	A.W.Rossaine	TDH	325	Text	5
C001	Fast Cook	Lata Kapoore	EPB	350	Cookery	8

TABLE:ISSUED

BOOK_ID	QUANTITY_ISSUED
F0001	3
T0001	1
C0001	5

Write SQL queries from b to g.

(b) To show Book name, Author name and Price of books of EPB publisher.

Ans: SELECT BOOK_NAME,AUTHOR_NAME, PRICE FROM BOOKS WHERE PUBLISHER ="EPB"

(c) To list the names of the books of FICTIONS type.

Ans: SELECT BOOK_NAME FROM BOOKS WHERE TYPE="FICTION"

(d) To display the names and prices of the books in descending order of their price.

Ans: SELECT BOOK_NAME, PRICE FROM BOOKS ORDER BY PRICE DESC;

(e) To increase the price of all books of First Pub.by 50.

Ans: UPDATE BOOKS SET PRICE= PRICE+50 WHERE PUBLISHERS = "FIRST PUBL"

(f) To Display the Book_ID, Book_Name and Quantity Issued for all books Which have been issued.

Ans:SELECT BOOK_ID, BOOK_NAME, QUANTITY_ISSUED FROM BOOKS,ISSUED WHERE BOOKS.BOOKID= ISSUED.BOOKID;

(g) To insert a new row in the table Issued having the following data: "F0002",4

Ans: INSERT INTO ISSUED VALUES("F0002",4)

(h) Give the output of the following queries on the above tables

(i) Select Count(Distinct Publishers) From Books

Ans: 3

(ii) Select Sum(Price) From Books Where Quantity>5

Ans: 1350

(iii) Select Book_Name,Author_Name From Books Where Price<500

Ans:

Book_Name	Author_Name
My First C++	Brian & Brooks
C++ Brainworks	A.W.Rossaine
Fast Cook	Lata Kapoor

(iv) Select Count(*) From Books

Ans: 5

20.Write SQL commands for (b) to (g) and write the outputs for (h) on the basis of tables TNTERIORS and NEWONES. (2003)

TABLE: INTERIORS

NO	ITEMNAME	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
1	Red rose	Double Bed	23/02/02	32000	15
2	Soft touch	Baby cot	20/01/02	9000	10
3	Jerry's home	Baby cot	19/02/02	8500	10
4	Rough wood	Office Table	01/01/02	20000	20
5	Comfort zone	Double Bed	12/01/02	15000	20
6	Jerry look	Baby cot	24/02/02	7000	19
7	Lion king	Office Table	20/02/02	16000	20
8	Royal tiger	Sofa	22/02/02	30000	25
9	Park sitting	Sofa	13/12/01	9000	15
10	Dine paradise	Dinning Table	19/02/02	11000	15

TABLE:NEWONES

NO	ITEM NAME	TYPE	DATEOFSTOCK	PRICE	DISCOUNT
11	White wood	Double bed	23/03/03	20000	20
12	James 007	Sofa	20/02/03	15000	15
13	Tom look	Baby cot	21/02/03	7000	10

(b) To show all information about the sofas from the INTERIORS table.

Ans: SELECT * FROM INTERIORS WHERE TYPE= "SOFA"

(d) To list ITEMNAME and TYPE of those items, in which DATEOFSTOCK is before 22/01/02 from the INTERIORS table in descending order of ITEMNAME.

Ans: SELECT ITEMNAME,TYPE FROM INTERIORS WHERE DATEOFSTOCK<'22/01/02' ORDER BY ITEMNAME

(e) To display ITEMNAME and DATEOFSTOCK of those items in which the Discount percentage is more than 15 from INTERIORS.

Ans: SELECT ITEMNAME,DATEOFSTOCK FROM INTERIORS WHERE DISCOUNT>15

(f) To count the number of items whose type is "Double bed";

Ans: SELECT COUNT(*) FROM INTERIORS WHERE TYPE="DOUBLE BED"

(g) To insert new row in the NEWONES table with the following data: 14, "True Indian ", "Office Table ", {28/03/03},15000,20

Ans: INSERT INTO NEWONES VALUES (14,"TRUE INDIAN","OFFICE TABLE",'28/03/03',15000,20)

(h) Give the outputs for the following SQL statements.

(i) Select COUNT (distinct TYPE) from INTERIORS;

Ans: 5

(ii) Select AVG(DISCOUNT)from INTERIORS where TYPE ="Baby cot";

Ans: 13

(iii) Select SUM(price)from INTERIORS where DATEOFSTOCK<{12/02/02};

Ans: 53000

21)Consider the following tables ACTIVITY and COACH and answer (b) and (c) parts of this question: (MP109-10)

Table: ACTIVITY

A Code	ActivityName	Stadium	Participants Num	Prize Money	Schedule Date
1001	Relay 100x4	Star Annex	16	10000	23-Jan-2004
1002	High jump	Star Annex	10	12000	12-Dec-2003
1003	Shot Put	Super Power	12	8000	14-Feb-2004
1005	Long Jump	Star Annex	12	9000	01-Jan-2004
1008	Discuss Throw	Super Power	10	15000	19-Mar-2004

Table: COACH

PCode	Name	Acode	
1	Ahmad Hussain	1001	
2	Ravinder	1008	
3	Janila	1001	
4	Naaz	1003	

b)Write SQL commands for the flowing statements:4
(i) To display the names of all activities with their Acodes in descending order.
Ans) SELECT Acodes, ActivityName FROM ACTIVITY ORDER BY Acode DESC;
(ii) To display sum of PrizeMoney for the Activities played in each of the Stadium separately.
Ans) SELECT SUM(PrizeMoney), Stadium FROM ACTIVITY GROUP BY Stadium;
(iii) To display the coach's name and ACodes in ascending order of ACode from the table COACH
Ans) SELECT Name, Acode FROM COACH ORDER BY Acode;
(iv) To display the content of the Activity table whose ScheduleDate earlier than 01/01/2004 in ascending order of ParticipantsNum.
Ans) SELECT * FROM ACTIVITY WHERE SchduleDate<'01-Jan-2004' ORDER BY ParticipantsNum;

c) Give the output of the following SQL queries:2
(i) SELECT COUNT(DISTINCT ParticipantsNum) FROM ACTIVITY;
Ans) 3
(ii)SELECT MAX(ScheduleDate), MIN(ScheduleDate) FROM ACTIVITY;
Ans) 19-Mar-2004 12-Dec-2003
(iii) SELECT Name,ActivityName FROM ACTIVITY A,COACH C WHERE A.Acode= C.Acode AND A.ParticipantsNum = 10;
Ans) Ravinder Discuss Throw
(iv) SELECT DISTINCT Acode FROM COACH;
Ans) 1001
1003
1008

22) Consider the following tables GAMES and PLAYER and answer (b) and (c) parts of this question (MP209-10)

Table: GAMES

GCode	GameName	Type	Number	Prize Money	Schedule Date
101	Carom Board	Indoor	2	5000	23-Jan-2004
102	Badminton	Outdoor	2	12000	12-Dec-2003
103	Table Tennis	Indoor	4	8000	14-Feb-2004
105	Chess	Indoor	2	9000	01-Jan-2004
108	Lawn Tennis	Outdoor	4	25000	19-Mar-2004

Table: PLAYER

PCode	Name	Gcode
1	Nabi Ahmad	101
2	Ravi Sahai	108
3	Jatin	101
4	Nazneen	103

b)Write SQL commands for the flowing statements:4
(i) To display the name of all GAMES with their GCodes
Ans) SELECT GameName,Gcode FROM GAMES;
(ii) To display details of those GAMES which are having PrizeMoney more than 7000.
Ans) SELECT * FROM Games WHERE Prizemoney>7000;
(iii) To display the content of the GAMES table in ascending order of Schedule Date.
Ans) SELECT * FROM Games ORDER BY ScheduleDate;
(iv) To display sum of PrizeMoney for each Type of GAMES
Ans) SELECT SUM(Prizemoney),Type FROM Games GROUP BY Type;

c) Give the output of the following SQL queries: 2
(i) SELECT COUNT(DISTINCT Number) FROM GAMES;
Ans) 2

(ii) SELECT MAX(ScheduleDate), MIN(ScheduleDate) FROM GAMES;
Ans) 19-Mar-2004 12-Dec-2003
(iii) SELECT Name, GameName FROM GAMES G, PLAYER P WHERE G.Gcode=P.Gcode AND G.PrizeMoney>10000;
Ans) Ravi Sahai Lawn Tennis
(iv) SELECT DISTINCT Gcode FROM PLAYER;
Ans) 3

23)Consider the following tables ACTIVITY and COACH. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii) (MP108-09) 6

Table: ACTIVITY

ACode	ActivityName	ParticipantsNum	PrizeMoney	ScheduleDate
1001	Relay 100x4	16	10000	23-Jan-2004
1002	High jump	10	12000	12-Dec-2003
1003	Shot Put	12	8000	14-Feb-2004
1005	Long Jump	12	9000	01-Jan-2004
1008	Discuss Throw	10	15000	19-Mar-2004

Table: COACH

PCode	Name	ACode
1	Ahmad Hussain	1001
2	Ravinder	1008
3	Janila	1001
4	Naaz	1003

i)To display the name of all activities with their Acodes in descending order.
Answer: SELECT ActivityName, ACode FROM ACTIVITY ORDER BY Acode DESC;
(ii) To display sum of PrizeMoney for each of the Number of participants groupings (as shown in column ParticipantsNum 10,12,16)
Answer: SELECT SUM(PrizeMoney), ParticipantsNum FROM ACTIVITY GROUP BY ParticipantsNum;
(iii) To display the coach's name and ACodes in ascending order of ACode from the table COACH
Answer: SELECT Name, ACode FROM COACH ORDER BY ACode;
(iv) To display the content of the ACTIVITY table whose ScheduleDate earlier than 01/01/2004 in ascending order of ParticipantsNum.
Answer: SELECT * FROM ACTIVITY WHERE ScheduleDate<'01-Jan-2004' ORDER BY ParticipantsNum;

v)SELECT COUNT(DISTINCT ParticipantsNum) FROM ACTIVITY;
Answer: 3
(vi)SELECT MAX(ScheduleDate), MIN(ScheduleDate) FROM ACTIVITY;

Answer:

19-Mar-2004	12-Dec-2003

(vii) SELECT SUM(PrizeMoney)
FROM ACTIVITY;

Answer: 54000

(viii) SELECT DISTINCT
ParticipantsNum FROM ACTIVITY;

Answer: 16
10
12

24) Consider the following tables SCHOOL and ADMIN. Write SQL commands for the statements (i) to (iv) and give outputs for SQL queries (v) to (viii).

TABLE: SCHOOL

CODE	TEACHERNAME	SUBJECT	DOJ	PERIODS	EXPERIENCE
1001	RAVI SHANKAR	ENGLISH	12/03/2000	24	10
1009	PRIYA RAI	PHYSICS	03/09/1998	26	12
1203	LISA ANAND	ENGLISH	09/04/2000	27	5
1045	YASHRAJ	MATHS	24/08/2000	24	15
1123	GAMAM	PHYSICS	16/07/1999	28	3
1167	HARISH B	CHEMISTRY	19/10/1999	27	5
1215	UMESH	PHYSICS	11/05/1998	22	16

TABLE: ADMIN

CODE	GENDER	DESIGNATION
1001	MALE	VICE PRINCIPAL
1009	FEMALE	COORDINATOR
1203	FEMALE	COORDINATOR
1045	MALE	HOD
1123	MALE	SENIOR TEACHER
1167	MALE	SENIOR TEACHER
1215	MALE	HOD

(i) To decrease period by 10% of the teachers of English subject.

UPDATE SCHOOL SET PERIOD = PERIOD*0.90;

(ii) To display TEACHERNAME, CODE and DESIGNATION from tables SCHOOL and ADMIN whose gender is male.

SELECT S.TEACHERNAME,S.CODE, A.DESIGNATION FROM SCHOOL, ADMIN A WHERE GENDER='MALE' AND S.CODE=A.CODE;

(iii) To display number of teachers in each subject.

SELECT SUBJECT, COUNT(*) FROM SCHOOL GROUP BY SUBJECT;

(iv) To display details of all teachers who have joined the school after 01/01/1999 in descending order of experience.

SELECT S.CODE,S.TEACHERNAME, S.SUBJECT, S.DOJ,S.PERIODS, S.EXPERIENCE,A.GENDER,A.DESIGNATION FROM SCHOOL S, ADMIN A WHERE DOB>'01/01/1999' AND S.CODE=A.CODE ORDER BY EXPERIENCE DESC;

(v) SELECT SUM(PERIODS), SUBJECT FROM SCHOOL GROUP BY SUBJECT;

SUM(PERIODS)	SUBJECT
51	ENGLISH
76	PHYSICS
24	MATHS
27	CHEMISTRY

(vi) SELECT TEACHERNAME, GENDER FROM SCHOOL, ADMIN WHERE DESIGNATION ='COORDINATOR' AND SCHOOL.CODE=ADMIN.CODE;

TEACHERNAME	GENDER
PRIYA RAI	FEMALE
LISA ANAND	FEMALE

(vii) SELECT DESIGNATION, COUNT(*) FROM ADMIN GROUP BY DESIGNATION HAVING COUNT(*)>1;

DESIGNATION	COUNT(*)
COORDINATOR	2
HOD	2
SENIOR TEACHER	2

(viii) SELECT COUNT(DISTINCT SUBJECT) FROM SCHOOL;

COUNT(*)
4

MODEL 2 : SINGLE TABLE

25. Given the following Teacher Relation. (2002)

Write SQL Commands fro (b) to (g)

No	Name	Department	DateofJoining	Salary	Sex
1	Raja	Computer	21/5/98	8000	M
2	Sangita	History	21/5/97	9000	F
3	Ritu	Sociology	29/8/98	8000	F
4	Kumar	Linguistics	13/6/96	10000	M
5	Venkatraman	History	31/10/99	8000	M
6	Sindhu	Computer	21/5/86	14000	M
7	Aishwarya	Sociology	11/1/1998	12000	F

(b) To select all the information of teacher in computer department

Ans: Select * from Teacher where Department="Computer"

(c) To list the name of female teachers in History Department.

Ans: Select Name from Teacher Where Sex="F" And Department="History"

(d) To list all names of teachers with date of admission in ascending order.

Ans: Select Name from Teacher Order By Dateofjoining Asc

(e) To display Teacher's Name, Department, and Salary of female teachers

Ans: Select Name,Department,Salary from Teacher Where Sex="F"

(f) To count the number of items whose salary is less than 10000

Ans: Select Count(*) from Teacher Where Salary<10000

(g) To insert a new record in the Teacher table with the following data:
8,"Mersha","Computer",(1/1/2000),12000,"M".

Ans: Insert into Teacher values ,"Mersha", "Computer",{1/1/2000),12000,"M");

26) Write the SQL commands for (i) to (vii) on the basis of the table SPORTS (2001)

TABLE: SPORTS

Stud no	Class	Name	Game1	Grade1	Game2	Grade2
10	7	Smeer	Criket	B	Swimming	A
11	8	Sujit	Tennis	A	Skating	C
12	7	Kamala	Swimming	B	Football	B
13	7	Veena	Tennis	C	Tennis	A
14	9	Archana	Basket ball	A	Cricket	A
15	10	Arpit	Cricket	A	Athletics	C

(i) Display the names of the students who have grade 'C' in either Game1 or Game2 or both.

Ans: Select Name From Sports Where Grade1="C" OR Grade2="C"

(ii) Display the number of students getting grade 'A' in Cricket.

Ans: Select Count(*) from Sports Where (Game1="Cricket" and Grade1="A") or (Game2="Cricket" and Grade2="A")

(iii) Display the names of the students who have same game for both game1 and game2

Ans: Select Name From Sports Where Game1=Game2

(iv) Display the games taken up by the students, whose name starts with 'A'.

Ans: Select Game1,Game2 From Sports Where Name Like "A%"

(v) Add a new column named 'marks'.

Ans: Alter Table Sports Add Marks Number(5);

(vi) Assign a value 200 for marks for all those who are getting grade 'B' or 'A' in both Game1 and Game2.

Ans: (Children, Try This Answer as an assignment)

(**vii)** Arrange the whole table in the alphabetical order of name.

Ans: Select * from Sports Order By Name

27. Write SQL commands for the (b) to (e) and write the outputs for (g) on thse basis of table CLUB. (2000)

TABLE: CLUB

COACH-ID	COACH NAME	AGE	SPORTS	DATEOF APP	PAY	SEX
1	KUKREJA	35	KARATE	27/03/96	1000	M
2	RAVINA	34	KARATE	20/01/98	1200	F
3	KARAN	34	SQUASH	19/01/98	2000	M
4	TARUN	33	BASKET BAL	01/01/98	1500	M
5	ZUBIN	36	SWIMMING	12/01/98	750	M
6	KETAKI	36	SWIMMING	24/02/98	800	F
7	ANKITA	39	SQUASH	20/02/98	2200	F
8	ZAREEN	37	KARATE	22/02/98	1100	F
9	KUSH	41	SWIMMING	13/01/98	900	M
10	SHAILYA	37	BASKETBALL	19/02/98	1700	M

(b) To show all information about the swimming coaches in the club.

Ans: Select * from Club where SPORTS= "SWIMMING"

(c) To list names of all coaches with their date of appointment (DATOFAPP) in descending order.

Ans: Select COACHNAME,DATEOFAPP from Club order by DATEOFAPP desc;

(d) To display a report, showing coachname, pay, age and bonus(15% of pay) for all coaches.

Ans:

Select Coachname,Pay,Age,Pay*0.15 from Club

(e) To insert a new row in the CLUB table with following data: 11,"PRAKASH",37,"SQUASH", {25/02/98},2500,"M"

Ans: Insert into Club Values (11,"PRAKASH",37,"SQUASH",{25/02/98}, 2500,"M")

(f) Give the output of the following SQL statements:

(i) select COUNT (distinct SPORTS)from CLUB;

Ans: 4

(ii) select MIN(AGE) from CLUB where SEX ="F";

Ans: 34

(iii) select AVG(PAY) fromCLUB where SPORTS = "KARATE";

Ans: 1100

(iv) select SUM(PAY) from CLUB where DATAOFAPP>{31/01/98};

Ans: 7800

(G) Assuming that there is one more table COACHES in the database as shown below:

TABLE:COACHES

SPORTS PERSON	SEX	COACH_NO
AJAY	M	1
SEEMA	F	2
VINOD	M	1
TANEJA	F	3

What will be the output of the following query:

SELECT SPORTS PERSON, COACHNAME
FROM CLUB,COACHES
WHERE COACH_ID=COACH_NO

Ans)

SPORTS PERSON	COACHNAME
AJAY	KUKREJA
SEEMA	RAVINA
VINOD	KUKREJA
TANEJA	KARAN

28) Given the following Teacher relation: Write SQL commands for questions (b) to (g). (1999)

TEACHER

NO	NAME	Age	DEPARTMENT	DATEOF JOING	SALARY	SEX
1	RAJA	45	COMPUTER	21/5/98	8000	M
2	SANGITA	32	History	21/5/97	9000	F
3	RITU	22	MATHS	29/8/98	8000	F
4	KUMAR	41	HISTORY	13/6/96	10000	M
5	VENKAT	44	MATHS	31/10/99	8000	M
6	SINDU	51	HISTORY	21/5/86	14000	F
7	ASHWARYA	37	MATHS	11/1/98	12000	F

(b) To show all information about the teachers of history department.

Ans:select * from teacher where department='history';

(c) To list names of female teacher who are in math department.

Ans: select name from teacher where sex='female' and department='maths';

d) To list names of all teacher with their date of joining in ascending order.
Ans:Select Name From Teacher order by dateofjoing;
(f) To count the number of teachers with age >23.
Ans: Select count(name) from teacher where age>23;
(g) To insert a new row in the teacher table with the following data:
9, "raja', 26, "computer", {13/5/95 }, 2300, "M".
Ans: Insert into Teacher values(9,"raja",26, "computer", {13/05/95},2300,"M");

29. Write SQL commands for (b) to (g) and write the outputs for (h) on the basis of table HOSPITAL (1998)

NO	NAME	AGE	DEPARTMENT	DATEOF ADM	CHARGES	SEX
1	Arpit	62	Surgery	21/1/98	300	M
2	Zareena	22	Ent	12/12/97	250	F
3	Kareem	32	Arthopedic	19/2/98	200	M
4	Arun	12	Surgery	11/1/98	300	M
5	Zubin	30	Ent	12/1/98	250	M
6	Karin	16	Ent	24/2/98	250	F
7	Ankita	29	cardiology	22/2/98	800	F
8	Zareen	45	Gynecology	22/2/98	300	F
9	Kush	19	Cardiology	13/1/98	800	M
10	Shilpa	23	Nuclear medicine	21/2/98	400	F

(b) To select all the information of patients of all cardiology department.
Ans: Select all from Hospital where department="Cardiology"
(c) To list the names of female patients who are in ent department.
Ans:select name from Hospital where Department="Ent" and Sex="F"
(d) To list names of all patients with their date of admission in ascending order.
Ans: Select name,dateofadm from Hospital dateofadm.
(e) To display patients name, charges, age, for only female patients.
Ans: Select Name,Charges,age from Hospital where sex="F"
(f) To count the number of patients with age <30.
Ans: Select count(*) from hospitals where age<30
(g) To insert the new row in the hospital table with the following data: 11, "aftab", 24, "surgery", {25/2/98}, 300, "M".
Ans: insert into Hospital values(11, "aftab", 24, "surgery", {25/02/98}, 300, "M")
(h) Give the output of the following SQL statements:
(i) Select count (distinct charges)from hospital;
Ans: 5
(ii) Select min(age) from hospital where sex = "f';
Ans: 16
(iii) Select sum(charges) from hospital where department = "ent";
Ans: 750
(iv) Select avg(charges) from hospital where date of admission is <{12/02/98};
Ans:380

13. BOOLEAN ALGEBRA

Laws:
(1)Properties of 0 and 1:
0 + X = X, 1 + X = 1,
0.X = 0, 1.X = X
(2) Idempotence Law:
(a)X +X = X (b)X.X = X
(3) Involution Law: $\overline{\overline{A}} = A$
(4)ComplementaryLaw:
(a)X + $\overline{X}$ =1 (b)X. $\overline{X}$ =0
(5)Commutative Law:
(a) X+Y =Y+X (b)X.Y=Y.X
(6) Associative Law:
(a)X + (Y+Z)=(X+Y)+Z
(b)X.(Y.Z)=(X.Y).Z
(7) Distributive Law:
(a) X(Y+Z)=XY+XZ (b) X+YZ=(X+Y)(X+Z)
(8) Absorption Law:
(a) X+XY=X (b)X(X+Y)+X
(c)X+X'Y = X+Y (d) X.(X'+Y) = X.Y
X+X'Y = X+Y is also known as third distributive law.
(9) Demorgan's Theorems
(a) $\overline{X + Y} = \overline{X}.\overline{Y}$ (b) $\overline{X.Y} = \overline{X} + \overline{Y}$

Model 1: Boolean Laws (2 Marks)

Model 1A: Boolean Laws (Truth Table) (2M)

1.State any one Distributive Law of Boolean Algebra and Verify it using truth table.

2019MP (2007D) (D2006) (2002)(1999) 2

Ans) Distributive Law:
(i)A (B+C) = AB + AC (ii) A+BC=(A+B)(A+C)
Verification of first distributive law using Truth Table: A (B+C) = AB + AC

A	B	C	B+C	A(B+C)	AB	AC	AB+AC
0	0	0	0	0	0	0	0
0	0	1	1	0	0	0	0
0	1	0	1	0	0	0	0
0	1	1	1	0	0	0	0
1	0	0	0	0	0	0	0
1	0	1	1	1	0	1	1
1	1	0	1	1	1	0	1
1	1	1	1	1	1	1	1

Comparing Column 5 and 8, Distributive law is verified

OR

Verification of second distributive law using Truth Table:

A	B	C	BC	A+BC	(A+B)	(A+C)	(A+B)(A+C)
0	0	0	0	0	0	0	0
0	0	1	0	0	0	1	0
0	1	0	0	0	1	0	0
0	1	1	1	1	1	1	1
1	0	0	0	1	1	1	1
1	0	1	0	1	1	1	1
1	1	0	0	1	1	1	1
1	1	1	1	1	1	1	1

Comparing Column 5 and 8, Distributive law is verified

2) Yerify the following using Truth Table: 2

X+Y. Z=(X+Y).(X+Z)

Ans

X	Y	Z	YZ	X+YZ	X+Y	X+Z	(X+Y).(X+Z)
0	0	0	0	0	0	0	0
0	0	1	0	0	0	1	0
0	1	0	0	0	1	0	0
0	1	1	1	1	1	1	1
1	0	0	0	1	1	1	1
1	0	1	0	1	1	1	1
1	1	0	0	1	1	1	1
1	1	1	1	1	1	1	1

VERIFIED

3) State any one Absorption Law of Boolean Algebra and verify it using truth table (2018)(OD2009)(OD2008)(OD2005)(2002) 2

Ans) Absorption Laws:

(a) X+XY=X (b)X(X+Y)=X

(c)X+X'Y = X+Y (d) X.(X'+Y) = X.Y

X+X. Y=X

X	Y	X.Y	X+X.Y	X
0	0	0	0	0
0	1	0	0	0
1	0	0	1	1
1	1	1	1	1

OR

X. (X+Y) = X

X	Y	X+Y	X. (X+Y)	X
0	0	0	0	0
0	1	1	0	0
1	0	1	1	1
1	1	1	1	1

OR

X+X'. Y=X+Y

X	Y	X'	X'.Y	X+X'. Y	X+Y
0	0	1	0	0	0
0	1	1	1	0	0
1	0	0	0	1	1
1	1	0	0	1	1

OR

X. (X'+Y) =X.Y

X	Y	X'	X'+Y	X. (X'+Y)	X.Y
0	0	1	1	0	0
0	1	1	1	0	0
1	0	0	0	0	0
1	1	0	1	1	1

4. Name the law shown below and verity it using a truth table. (2014)

X+X'.Y=X+Y

Answer :

X	Y	X'O	X'Y	X+X'Y	X+Y
0	0	1	0	0	0
0	1	1	1	1	1
1	0	0	0	1	1
1	1	0	0	1	1

Hence Proved

X+X'.Y=X+Y

This is absorption law (In some books it is written as as third distributive law.)

5.State DeMorgan's Laws of Boolean Algebra and verify them using truth table.

(2017) (OD2007) (2003)(1998)

Ans)(i) (X+Y)' = X'.Y' (ii) (X.Y)' = X'+Y'

X	Y	X'	Y'	X+Y	(X+Y)'	X'.Y'
0	0	1	1	0	1	1
0	1	1	0	1	0	0
1	0	0	1	1	0	0
1	1	0	0	1	0	0

X	Y	X'	Y'	X.Y	(X.Y)'	X'+Y'
0	0	1	1	0	1	1
0	1	1	0	0	1	1
1	0	0	1	0	1	1
1	1	0	0	1	0	0

State and verify De Morgan's law in Boolean Algebra. (D2008) (MP108-09 2

6)State and verify AssociativeLaw. (OD2006) 2

Ans) (D2005)

(i) X+(Y+Z)=(X+Y)+Z

X	Y	Z	Y+Z	X+Y	X+(Y+Z)	(X+Y)+Z
0	0	0	0	0	0	0
0	0	1	1	0	1	1
0	1	0	1	1	1	1
0	1	1	1	1	1	1
1	0	0	0	1	1	1
1	0	1	1	1	1	1
1	1	0	1	1	1	1
1	1	1	1	1	1	1

(ii) X.(Y.Z)=(X.Y).Z

X	Y	Z	Y.Z	X.Y	X.(Y.Z)	(X.Y).Z
0	0	0	0	0	0	0
0	0	1	0	0	0	0
0	1	0	0	0	0	0
0	1	1	1	0	0	0
1	0	0	0	0	0	0
1	0	1	0	0	0	0
1	1	0	0	1	0	0
1	1	1	1	1	1	1

7) Verify the following using truth table: (2012)2

(i) X,X' = 0

Ans

X	X'	X . X'	0
0	1	0	0
1	0	0	0

Verified

(ii) X+1=1

X	1	X +1
0	1	1
1	1	2

Verified

8) Verify X'Y + X.Y' + X'Y' = (X' + Y') using truth table. (D2009) 2

Ans)

X	Y	X'	Y'	X'Y	XY'	X'Y'	X'Y'+XY'+X'Y'	X'+Y'
0	0	1	1	0	0	1	1	1
0	1	1	0	1	0	0	1	1
1	0	0	1	0	1	0	1	1
1	1	0	0	0	0	0	0	0

VERIFIED

Model 1B: Boolean Laws – Algebraic Method (2Marks)

1) State and verify De Morgan's law in Boolean Algebra. (MP109-10) **(D2008) 2**

Ans) (i) (X+Y)'= X'.Y' (ii) (X.Y)'= X'+Y'

Verification

(X+Y)'.(X+Y) = X'.Y'.(X+Y)
0 = X'.Y'.X + X'.Y'.Y
0 = X'.X .Y'+ X'.0
0 = 0 .Y'+ 0
0 = 0 + 0
0 = 0
L.H.S = R.H.S

2) State and verify Absorption Law in Boolean algebra.(OD2008) (OD2005)(2004) (MP208-09)2

Ans)(a) X+XY = X (b)X(X+Y) = X
(c)X+X'Y = X+Y (d) X.(X'+Y) = X.Y

Algebraic Verification:

(a) X+XY = X

LHS X+X.Y = X.1+X.Y
= X.(1+Y)
=X.1
=X RHS
Verified

OR

(b)X(X+Y) = X

LHS X.(X+Y) = XX+X.Y
= X.1+X.Y
= X.(1+Y)
= X.1
=X RHS
Verified

OR

(c)X+X'Y = X+Y

LHS X+X'. Y = (X+X')(X+Y)
= 1.(X+Y)
= X+Y RHS
Verified

OR

(d) X.(X'+Y) = X.Y

LHS X(X'+Y) = XX'+X.Y
= 0+X.Y
= X.Y RHS
Verified

3. Verify the following using Boolean Laws. (2016)2

X'+ Y'Z = X'.Y'.Z'+ X'.Y.Z'+ X'Y.Z+ X'.Y'.Z+ X.Y'.Z

Ans LHS =X' + Y'.Z
= X'.(Y + Y').(Z + Z') + (X + X').Y'.Z
= X'.Y.Z + X'.Y.Z' + X'.Y'.Z + X'.Y'.Z' + X.Y'.Z
+ X'.Y'.Z
= X'.Y.Z + X'.Y.Z' + X'.Y'.Z + X'.Y'.Z' + X.Y'.Z
= X'.Y'.Z' + X'.Y.Z' + X'.Y.Z + X'.Y'.Z + X.Y'.Z
= RHS

OR

RHS=X'.Y'.Z' + X'.Y.Z' + X'.Y.Z + X'.Y'.Z + X.Y'.Z
= X'.Y'.Z + X'.Y'.Z' + X'.Y.Z + X'.Y.Z' + X.Y'.Z
= X'.Y'.(Z+Z') + X'.Y.(Z+Z') + X.Y'.Z
= X'.Y' + X'.Y + X.Y'.Z
= X'.(Y'+Y) +X.Y'.Z
= X' + X.Y'.Z
= (X' + X).(X' + Y'.Z)
= X' + Y'.Z
= LHS

4.Verify the following using Boolean Laws.

U'+ V= U'V'+U'.V +U.V (2015)

L.H.S =U'+ V
=U'.(V+V')+ V.(U'+ U)
=U'.V + U'.V' + U'.V + U.V
=U'.V+U'.V'+U.V
=R.H.S

OR

R.H.S =U'V'+U'.V +U.V
=U'.(V'+ V)+ U.V
=U'.1 + U.V
=U'+ U.V
=U'+ V =L.H.S

5) Verify the following using Boolean Laws

X+Z = X + X'.Z + Y.Z (2013) 2

Ans: RHS X + X'.Z + Y.Z
= X + Z + YZ (X + X'Y = X+Y)
= X + Z.1 + Z.Y
= X + Z (1 + Y)
= X + Z.1
= X + Z LHS

6)Verify the following algebraically 2

(A'+B').(A +B)=A'.B+A.B' (2011)

Ans. LHS

(A' +B') . (A+B)
= A'.A + A'.B + A.B' + B'.B
= 0 + A'.B + A.B'+ 0
= A'.B + A.B'
= RHS (Verified)

7)Verify the following algebraically:(OD 2010)2

X'.Y + X.Y' = (X'+Y').(X+Y)

Ans. R. H . S

(X'+y').(x+y)
= x'.(x+y)+y'.(x+y)
= x.x'+X'.y+y'.x+y'.y
= x'.y+y'.X
= x'.y+x.y'

So L.H.S=R.H.S

OR

L.H.S.
X'.Y + X.Y'
= (X'.Y+X) (X'.Y+Y')
= (X'+X).(Y+X).(X'+Y').(Y+Y')
= 1.(X+Y).(X' +Y').1 = (X+Y).(X'+Y') = R.H.S.

8) Verify X.Y'Z+X.Y'Z'+X'.Y'Z = X.Y' + Y'.Z algebraically. (2003)

9) Prove XY + YZ + Y'Z =XY + Z, algebraically. (2002) 2

10) Prove algebraically:

x'y'z'+x'y'z+x'yz'+x.y'z=x'+y' (2001)

11) Prove X'.Y+Y'.Z= X'.Y.Z+X'.Y'.Z'+ X.Y'.Z+X'.Y'.Z algebraically. (2000)

12) Prove x+x'y=x+y algebraically. (1999)

13) Prove X+Y'Z=(X+Y'+Z')(X+Y'+Z)(X+Y+Z) algebraically. (1998)

Model 1C: Correct the Boolean Laws/Statements (2Marks)

Correct the following boolean statements:

1. X+1 = X 2. (A')'=A'

3. A+A'=0 4. (A+B)' = A.B (2017 MP)

A) 1. X+1 =1 or X+0=X 2. ((A')') = A

3. A + A'= 1 or A . A'=0 4. (A+B)' = A' . B'

Model 2A: Write SOP Form (1 Mark)

(Consider Only 1's combinations from the Result Column. Here Variable Value is 1)

1.Derive a Canonical SOP expression for a Boolean function F(X,Y,Z) represented by the following truth table: 2019MP1

X	Y	Z	F(X,Y,Z)
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Ans: F(X,Y,Z)= X'Y'Z'+X'Y'Z+XY'Z'+XYZ

OR

F(X,Y,Z)=Σ(0,1,4,7)

2) Write the SOP form of a Boolean Function F, Which is represented by the following truth table: (D2005)1

A	B	C	F
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

Ans) **A'.B'.C' + A'.B.C + A.B.C' + A.B.C**

3) Write the SOP form of a Boolean function G, which is represented in a truth table as follows: (MP208-09)1

P	Q	R	G
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

Ans) G(P,Q,R) = P'.Q.R'+P.Q'.R'+P.Q.R'+P.Q.R

4) Try following:

A	B	C	F(A,B,C)
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

U	V	W	G
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Model 2B: Write POS Form (1 Mark)

(Consider Only 0's combinations from the Result Column. Here Variable Value is 0)

1) Derive a canonical POS expression for a Boolean function FN, represented by the following truth table. (2018)

X	Y	Z	FN(X,Y,Z)
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Ans: FN(X,Y,Z)=

(X+Y'+Z).(X+Y'+Z').(X'+Y+Z').(X'+Y'+Z)

OR

FN(X,Y,Z)= Π (2,3,5,6)

2. Write the POS form of a Boolean Function F, which is represented in a truth table as follows: (2017 MP)

P	Q	R	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

A) F(P,Q,R) = (P+Q+R).(P'+Q+R).(P'+Q'+R)

3) Write the POS form of a Boolean function H, which is represented in a truth table as follows: (D2009) 1

A	B	C	H
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

Ans) H(A,B,C) = (A+B+C).(A'+B+C').(A'+B'+C)

OR

H(A,B,C) = Π (0, 5, 6)

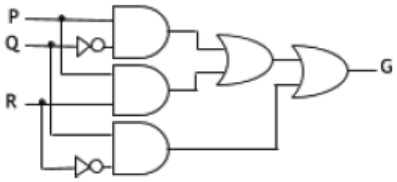
4) Try following:

X	Y	Z	F
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	0

x	y	z	F
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

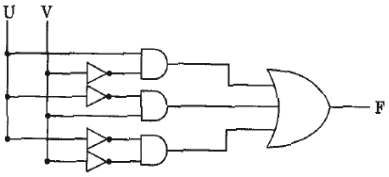
Model 3A: Write the Equivalent Boolean Expression (2 Marks)

1.Write the Boolean Expression for the result of the Logic Circuit as shown below: (2016)



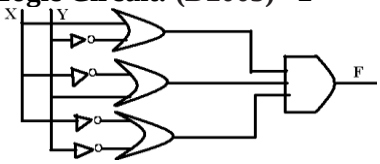
P.Q' + P.R + Q.R'

2) Write the equivalent expression for the following Logic Circuit : (OD2005) 2



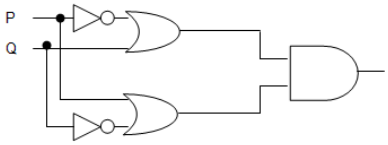
Ans) U.V'+U'.V+U'.V

3) Write the equivalent Boolean expression for the following Logic Circuit: (D2005) 2

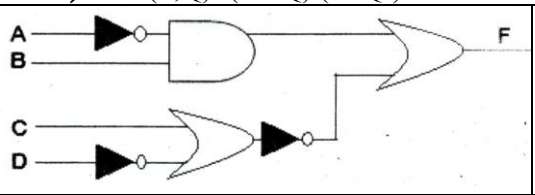
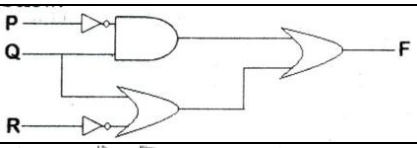
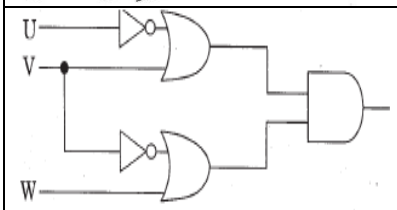
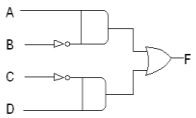
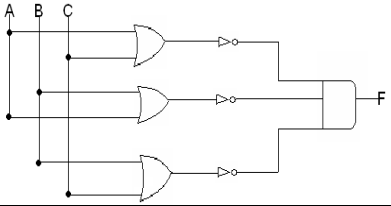


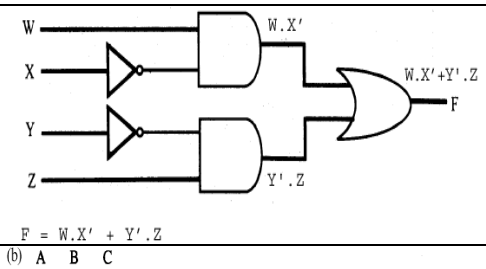
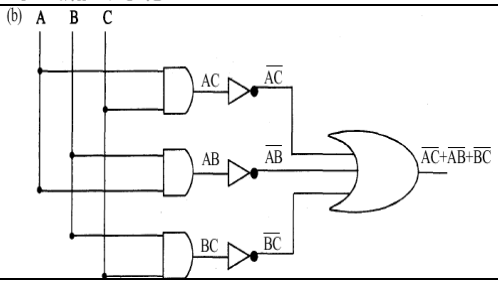
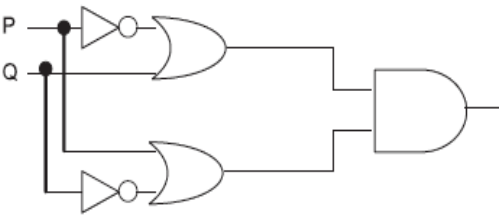
Ans) (X+Y')(X'+Y)(X'+Y')

4)Write the equivalent Boolean Expression for the following Logic Circuit (MP108-09) 2



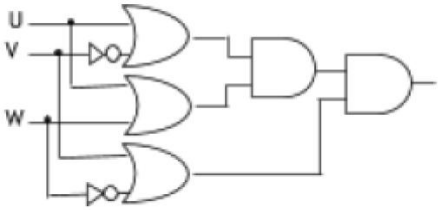
Ans) F(P,Q)=(P'+Q).(P+Q')

	**2014**
	**2013**
	**OD2010**
	**OD2007**
	**D2007**

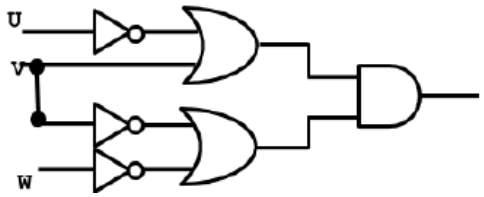
	
	**OD2006**
	**MP10 9-10**

Model 3B: Draw the Logic Circuit (2 Marks)

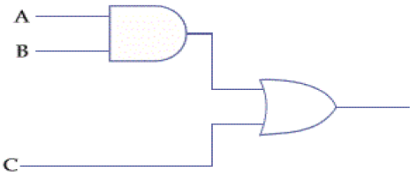
1.Draw the Logic Circuit of the following Boolean Expression:
((U + V').(U + W)). (V + W') 2019MP2



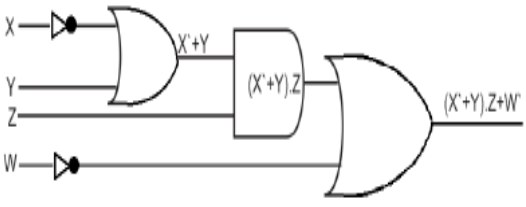
2) Draw the Logic Circuit of the following Boolean Expression: (U'+V).(V'+W') (2018)2



3.Draw the equivalent logic circuit for the following Boolean expression: (A.B)+C (2017MP)

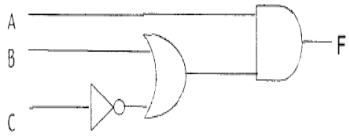


4. Draw the Logic Circuit for the following Boolean Expression : (X'+Y).Z+W' **(2015)**



5) Draw a logical circuit diagram for the following Boolean Expression: (OD2008) 1

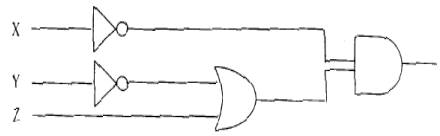
A.(B+C')



Ans)

6) Draw a Logical Circuit Diagram for the following Boolean Expression. (D2008) 1

X'.(Y'+Z)

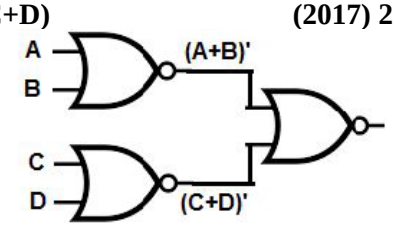


7) Draw a logical circuit diagram for the following Boolean expression: A'.(B+C) 1

Model 3B: Draw the Logic Circuit Using NAND or NOR gates (2 Marks)

1. Draw the Logic Circuit of the following Boolean Expression using only NOR Gates:

(A+B).(C+D) (2017) 2



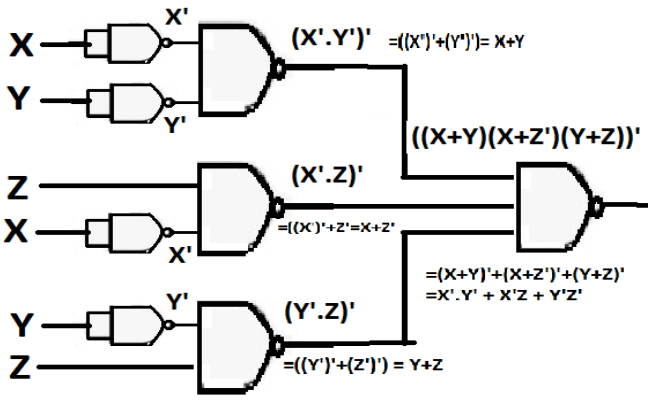
2) Represent the Boolean expression X'Y+Y'Z with the help of **NAND** gates only. (2000)

3) Represent the Boolean expression (X+Y)(Y+Z)(X+Z) with help of **NOR** gates only. (2002) 1

4) Represent the Boolean expression (x+y)(y+z)(z+x) with the help of **NOR** gates only. (1999)

5) Represent the Boolean expression X+Y.Z' with the help of **NOR** gates only. (1998)

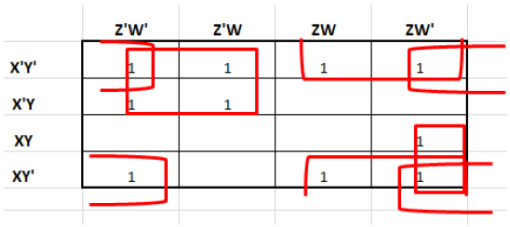
REPRESENT X'Y' + X'Z + Y'Z' using NAND gates only



Model 4A: Reduce the Boolean Expression using K-Map Σ (3 Marks)

1.Reduce the following Boolean Expression to its simplest form using K-Map: 2019SP3

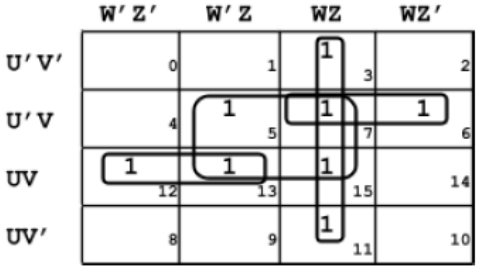
F(X,Y,Z,W)= Σ (0,1,2,3,4,5,8,10,11,14)



Answer: X'Z'+Y'W'+Y'Z+XZW'

2) Reduce the following Boolean Expression to its simplest form using K-Map:2018 (3)

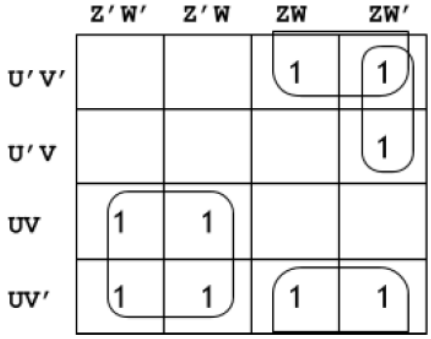
G(U,V,W,Z) = ∑ (3,5,6,7,11,12,13,15)



F(U,V,W,Z)= VZ + WZ + UVW'+ U'VW

3. Reduce the following Boolean expression to its simplest form using K-Map: (2017)

E(U,V,Z,W)= Σ (2,3,6,8,9,10,11,12,13)



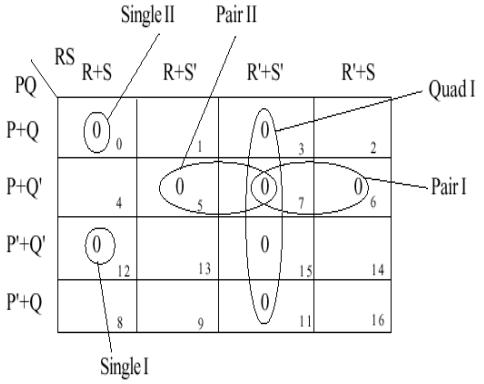
E(U,V,Z,W) = UZ' + V'Z + U'ZW'

K-MAP (SOP)	Year
F(A,B,C,D) = Σ (0,1,3,5,6,7,9,11,13,14,15)	2017
F(P,Q,R,S) = ∑ (0,4,5,8,9,10,11,12,13,15)	2016
F(X,Y,Z,W) = Σ(0,1,4,5,6,7,8,9,11,15)	2015
F(A,B,C,D) = Σ(1,3,4,5,6,7,12,13)	2014
F(U,V,W,Z) = Σ (0,1,2,3,6,7,8,9,10,13,15)	2013
F(A, B, C, D) = Σ (2, 3, 4, 5, 6, 7, 8, 10, 11)	2012, D2010
F(A, B,C, D) =∑(0,1, 2, 4, 5, 6, 7, 8, 10)	2011
F(U, V, W, Z) = Σ (3, 5, 7, 10, 11, 13, 15)	D2010
F (A,B,C,D) = Σ (3,4,5,6, 7,13,15)	OD2010
F(P,Q,R,S) = ∑ (1,2,3,5,6,7,9,11,12,13,15)	D2009
H(U,V,W,Z) = ∑(0,1,4,5,6,7,11,12,13,14,15)	OD2009
F(A,B,C,D) = ∑(0,1,2,,4,5,8,9,10,11)	OD2008
F(A,B,C,D) = ∑(0,2,3,4,6,7,8,10,12)	D2008
F(U, V, W, Z) = ∑(0,1,2,3,4,10,11)	D2007
F(P, Q, R, S,) = ∑(0,3,5,6,7,11,12,15)	D2006
F(A, B, C, D,) = ∑(0,1,2,3,4,5,10,11,15)	OD2005
F(a,b,c,d) = ∑(0,1,2,4,5,7,8,9,10,11,14)	2004
F(U,V,W,Z,)=∑(0,2,3,4,7,9,10,13,14,15)	2003
F(w,x,y,z)=∑(2,3,6,10,11,14)	2002
F(x,y,z,w)= ∑ (1,3,4,5,7,9,11,12,13,15)	2000
F (w,x,y,z) = ∑ (0,4,8,12	1999
F(U, V, W,Z) = ∑(0,1,3,5,7,9,10,11,12,13,14,15)	1998
F(A,B,C,D)= Σ (0,1,2,4,5,6,8,10)	MP108-09
F(A,B,C,D)=Σ(0,1,2,4,5,6,8,10)	MP109-10

Model 4B: Reduce the Boolean Expression using K-Map Π (3 Marks)

1) Reduce the following Boolean expression using K – Map : (OD2006) 3

F(P, Q, R, S,) = Π (0,3,5,6,7,11,12,15)

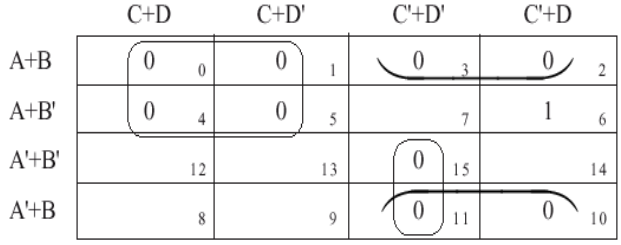


F(P,Q,R,S)= (P+Q+R+S).(P'+Q'+R+S).(P+Q'+R').(P+Q'+S').(R'+S')

2) Reduce the following Boolean expression using K – Map : (D2005) 3

F(A, B, C, D,) = Π (0,1,2,3,4,5,10,11,15)

Ans) F(A, B, C, D,) = Π (0,1,2,3,4,5,10,11,15)



F(A, B, C, D) = (A+C) . (B + C') . (A'+C'+D')

$F(A, B, C, D) = \sum(6, 7, 8, 9, 12, 13, 14)$

K-MAP (POS)	Year
F(A, B, C, D,) = Π (5, 6, 7, 8, 9, 12, 13, 14, 15)	OD2007
F(a,b,c,d) = Π (0,1,3,4,5,7,8,9,11,12,13,15)	2001
F(U,V,W,Z)= Π (0,1,2,4,5,6,8,10)	MP208-09
F(A,B,C,D)= Π (1,3,4,5,7,9,11,12,13,14)	
F(U,V,W,Z)= Π (0,1,2,4,5,6,8,10)	MP209-10

Model 5A: Convert the expression into SOP (1Mark)

1) Convert the following Boolean expression into its equivalent Canonical Sum of Product Form (SOP): (D2008) 2

(X'+Y+Z').(X'+Y+Z).(X'+Y'+Z).(X'+Y'+Z')

Ans) F(X,Y,Z) = Π (4,5,6,7)

= ∑ (0,1,2,3)

=X'Y'Z' + X'Y'Z + X'YZ' + X'YZ

Write equivalent Canonical SOP for following	Year
F(X, Y,Z) = Π (1,3,6,7)	D2007
(U'+V'+W').(U+V'+W').(U+V+W).	

Model 5B: Convert the expression into POS (1Mark)

1) Convert the following Boolean expression into its equivalent Canonical Product of sum form (POS): A.B'C + A'.B.C + A'.B.C'. (OD200) 2

Ans) A.B'C + A'.B.C + A'.B.C'

= m5 + m3 + m2

= ∑(2,3,5)

= Π (0,1,4,6,7)

= (A+B+C)((A+B+C')(A'+B+C)(A'+B'+C)(A"+B'+C')

2) Write the equivalent canonical product of sum expression for the following sum of product expression: (OD2007) 2

F(X, Y,Z) = ∑ (0, 2,4,5)

Ans)F(X, Y, Z) = Π (1, 3, 6, 7)

OR

F=(X+Y+Z')(X+Y'+Z')(X'+Y'+Z)(X'+Y'+Z')

Model 6A: Express the following in SOP (1 Mark)

1) Express P +Q'R in canonical SOP form. (D2006)1

(P + Q'R) = P.1.1 + 1.Q'.R

= P (Q+Q')(R+R') + (P+P')Q'R

= (PQ +PQ') (R + R') + PQ'R + P'Q'R

= PQR + PQ'R + PQR' + PQ'R' + PQ'R+ P'Q'R

= PQR + PQ'R + PQR' + PQ'R' + P'Q'R

Model 6B: Express the following in POS (1 Mark)

1) Express P +Q'R in POS form. (OD 2006)1

P +Q'R = (P+Q').(P+R)

= (P+Q'+0).(P+0+R)

= (P+Q'+RR').(P+QQ'+R)

= (P+Q'+R) (P+Q'+R') (P+Q+R)(P+Q'+R)

= (P+Q'+R).(P+Q'+R').(P+Q+R)

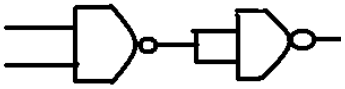
Model 7: Mislleneous Models

Write the dual of the followins Boolean Expression

(B'+C).A	**2003**
(x+y).(x'+y')	**1999**
(U+W)(V'U+W)	**1998**

2) Seven inverters are cascaded one after another. What is the output if the input is 1? (2001)

3) Given the following circuit:



What if the output if (i) both inputs are FALSE(0)
(ii) one is FALSE and the other is TRUE.

4) State and verify Duality Principle. (2001)

14.COMMUNICATION AND NETWORK CONCEPTS

Theory Question: Fundamental Concepts

1) Mention one advantage of networking(2001). 1

Ans: Advantages/Need for networking or Network Goals:

(i) Resource Sharing: Hardware Resources like printers, Softwares can be shared between all computers in the network.

(ii) Reliability: A file can have copies in two or more computers.

(iii) Cost Factor

(iv) Communication Medium: Using a network, it is possible for managers, working far apart, to prepare financial report of the company, etc

2) What was the role of ARPANET in the Computer Network? (D2010)1m

OR

What is the significance of ARPANET in the network? (MP108-10) 1

Ans) The first evolution of network was jointly designed by The Advanced Research Projects Agency (ARPA) and Department of Defence (DoD) of united states in 1969 and was called ARPANET. It was an experimental project, which connected a few computers of some of the reputed universities of USA and DoD. ARPANET allowed access and use of computer resource sharing projects. This ARPANET was handed over to Defence Communication Agency (DCA) for further development.

3) What is NFS? (2001) 1

4) Differentiate between Internet and Intranet (D2006) 1

Ans)Internet is a network of computer networks which operates world-wide using a common set of communications protocols.

Intranet is an inter-connected network within one organization that uses Web technologies for the sharing of information internally.

5) What do you understand by a backbone network? (1998)1

Ans: A backbone is central interconnecting structure that connects one or more networks just like the trunk of a tree or the spine of a human being.

LAN,MAN,WAN,PAN

1.Assume that 50 employees are working in an organization. Each employee has been allotted a separate workstation to work. In this way, all computers are connected through the server and all these workstations are distributed over two floors. In each floor, all the computers are connected to a switch. Identify the type of network? 2019MP1

Ans: LAN(Local Area Network)

2) Daniel has to share the data among various computers of his two offices branches situated in the same city. Name the network (out of LAN, WAN, PAN and MAN) which is being formed in this process. (2017MP)1

Ans : MAN

3.Differentiate between PAN and LAN types of networks. (2016) 1

PAN (Personal Area Network)	LAN (Local Area Network)
A personal area network PAN is a computer network organized around an individual person.	LAN interconnects a high number of access or node points or stations within a confined physical area upto a kilometer

4. Which type of network (out of LAN, PAN and MAN) is formed, when you connect two mobiles using Bluetooth to transfer a Video. 2013

Ans: PAN (Personal Area Network)

5 In networking, what-is WAN? How is it different from LAN? (2011) 1

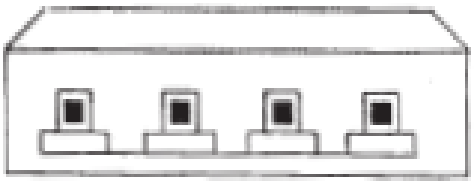
Ans A WAN (wide area network), is not restricted to a geographical location, although it might be confined within the bounds of a state or country. A WAN connects several LANs, and may be limited to an enterprise (a corporation or an organization) or accessible to the public. The technology is high speed and relatively expensive. The Internet is an example of a worldwide public WAN.

A LAN (local area network) is a group of computers and network devices connected together, usually within the same building or campus.

6) What is the difference between LAN and WAN? (OD2009) 1

Ans LAN (Local Area Network):

Interconnects a high number of access or node points or stations within a confined physical area. An example is the territory covered in a single office building that houses various departments/offices. All these areas are interconnected using a LAN.



WAN (Wide Area Network)

It is used to connect systems with no limitation of geographical area. It is used to serve many locations distributed over a large geographical area. A system of overnight teller machines used by a banking organisation covering the North of India is an example of a WAN. Internet is also an example of the same.

7) What is the difference between MAN and WAN? (2003)(1999) 1m

8) What is the difference between LAN and WAN? (2000) 1m

LAN	WAN
Diameter of not more than a few kilometers.	Span entire countries
A total data rate of atleast several Mbps	Data rate less than 1 Mbps(Megabits per Second)
Complete ownership by a single organization	Owned by multiple organization
Very low error rates	Comparatively higher error rates

9) What is the difference between LAN and MAN? (1998) 1

SWITCHING TECHNIQUES

1) Name two switching techniques used to transfer data between two terminals(computers). (D2009)1

Ans Circuit Switching , Message Switching and Packet Switching

2) What is the difference between Message Switching technique and Packet Switching technique? (2015) (D2005)(2002) 1m

Ans:

Message Switching	Packet Switching
The source computer sends data (**message**) to the switching office, which stores data in a **buffer**. It then looks for a free link to another switching office and sends data to that office. This process continues until data is delivered to the destination computer	The source computer sends data (message) in a fixed size of **Packet** to the switching office, which stores data in **main memory**. It then looks for a free link to another switching office and sends data to that office. This process continues until data is delivered to the destination computer
Message Switching follows store and forward principle for complete message.	Packet Switching follows store and forward principle for fixed packets
No limit on block size.	Fixes an upper limit for packet size

3) Define Packet switching? (2004) 1m

4) Compare any two Switching techniques. MP109-10)1

GUIDED & UNGUIDED MEDIA

1. Your friend wishes to install a wireless network in his office. Explain him the difference between guided and unguided media. (2019MP)1

Answer: Guided media uses cables to connect computers, whereas unguided media uses waves.

2.Differentiate between communication using Optical Fiber and Ethernet Cable in context of wired medium of communication technologies. (2017)2

Ans)

Optical Fibre	Ethernet Cable
Very Fast	Slower as compared to Optical Fiber
Expensive	Less Expensive as compared to Optical Fiber
Immune to electromagnetic interference	Prone to electromagnetic interference

3. Out of the following, which is the fastest (i) wired and (ii) wireless medium of communication? (2015)1

Infrared, Coaxial Cable, Ethernet Cable, Microwave, Optical Fiber

Ans (i) Wired - Optical Fiber

(ii) Wireless - Infrared OR Microwave

4. Write two advantages of using an optical fibre cable over an Ethernet cable to connect two service stations, which are 200m away from each other. (2014) 1

Ans: Two advantages of using an optical fibre cable over an Ethernet cable:

Provides high speed

Electrical and magnetic interference does not affect the transmission.

5. How is Coaxial cable different from Optical Fibre? (D2008)(OD2005) 1

Ans) Coaxial Cable: Comparatively Slow, Economic, convenient to lay down, used in Bus topology of networks

Optical Fibre: Very fast, expensive, reliable, no interference

6) Write one difference between Coaxial and optical cable? (2004) 1

7) Write an advantage and a disadvantage of using optical fibre cables? (2003) 1

8) Name two transmission media for networking. (OD2006) 1m

Ans) Optical Fiber,Ethernet Cable or twisted pair cable or UTP or STP,Co-axial Cable,,Infrared, Radio Link OR Radiowave, Microwave link OR Microwave, Satellite Link

9) Name two communication channels used in networking and explain any one. (2001) 2

TOPOLOGIES:

1) Differentiate between Bus Topology and Star Topology of Networks. What are the advantages and disadvantages of Star Topology over Bus Topology? (2018)(D2009)(D2006)

Ans:

Bus Topology: It is characterised by common transmission medium shared by all the connected hosts, managed by dedicated nodes. It offers simultaneous flow of data and control.

Bus

Star Topology: It is characterised by central switching node (communication controller) and unique path (point to point link) for each host. It is easy to add and remove additional hosts by upgrading the centralised node.

Star

Advantages of Star Topology over Bus Topology: ● Faster communication as compared to Bus topology ● Independent line of connection allows freedom of removing or adding nodes from the network
*Fault detection is easy.
*Fault isolation is easy.

Disadvantages of Star Topology over Bus Topology: ● Expensive as compared to Bus topology ● Long cable length

2) Write two advantages and two disadvantages for STAR topology? (2004)1

3) Write one advantage and one disadvantage of the following topologies in network: (2003)2
i)STAR Topology ii)BUS Topology

4) Mention one difference between Linear and Star topologies in networking. (2001)1

5) Write the two advantages and two disadvantages of BUS Topology in network? (2000)2

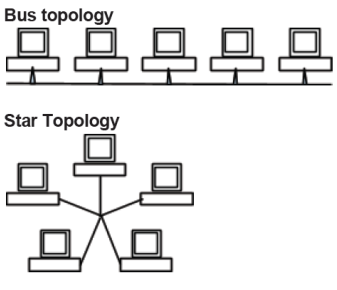
6) Write two advantages and disadvantages of the following topologies in a Network. (2002)1
i) BUS ii)RING

7) Give two advantages and disadvantages of following network topologies: (1999)2
i)BUS ii) Tree

8) Identify the type of topology on the basis of the following: (2017MP)
a. Since every node is directly connected to the server, a large amount of cable is needed which increases the installation cost of the network.
b. It has a single common data path connecting all the nodes. 2

Ans: a. Star Topology b. Bus Topology

9. Illustrate the layout for connecting 5 computers in a Bus and a Star topology of Networks.
(2015) 2

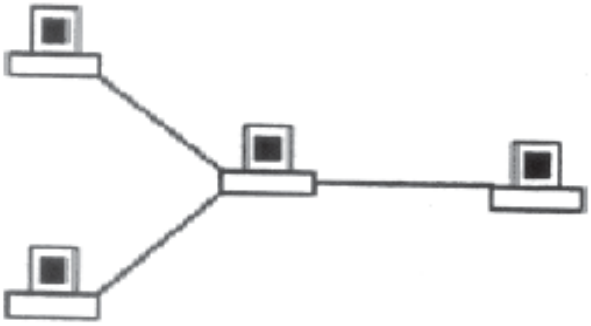


OR any valid illustration of Bus and Star Topology.

10) Write one advantage of Bus Topology of network. Also, illustrate how 4 computers can be connected with each other using star topology of network. (2012)2

Ans Cable length required for this topology is the least compared to other networks.

Illustration of 4 computers connected with each other using star topology of network.



Theory Question : Communication Devices

1)What is the purpose of using a repeater in the context of networking? (2003)1

2) What are repeaters? (1998)1

A) A repeater is a network device that amplifies and restores signals for long distance transmission.

It is used in long network lines, which exceed the maximum rated distance for a single run.
Repeaters are of two types:

(i)Amplifier : amplifies all incoming signals over the network. (it amplifies both the signal and any concurrent noise)

(ii) Repeater : collected inbound packet and then retransmits the packet as if it were starting form the source station.

3) What is a Hub? (D2008)1

Ans)A Hub is used for a central connection between two or more computers on a network.

OR

A Hub is a network device used to connect two or more computers. **OR**
A Hub is an unintelligent network device to connect computers.

Hubs are of two types:

(i) Active hubs: electrically amplify the signal as it moves from one connected device to another.

(ii) Passive hubs: allow the signal to pass from one computer to another without any change.

3) What is a Modem? (OD2008)1

Ans) Modem is a Modulation Demodulation device that converts analog signal to digital signal and vice versa.

4) What is the purpose of using a MODEM?(2000)1

5) What is a Modem? (2002)1

6) What is a bridge? (1999)1

A) A bridge is a device that lets you link two networks together. Bridges are smart enough to know which computers are on which side of the bridge, so they only allow those messages that need to get to the other side to cross the bridge. This improves performance on both sides of the bridge.

As a packet arrives at the bridge, the bridge examines the physical destination address of the packet. The bridge then decides whether or not to let the packet cross.

OR

A bridge is a network device that establishes an intelligent connection between two local networks with the same standard but with different types of cables.

7) What are Routers? (2000)1

A) A router is a network device that is used to separate different segements in a network to improve performance and reliability. A router works like a bridge but can handle different protocols.

Compared to hubs and switches, routers are smarter still. Routers use a more complete packet address to determine which router or workstation should receive each packet next. Based on a network road map called arouting table routers can help ensure that packets are travelling the most efficient paths to their destination. If a link between routers fails, the sending router can determine an alternate route to keep traffic moving.

DATA TRANSFER UNITS

1) Define the term Bandwidth. Give any one unit of Bandwidth. (MP208-10)(MP209-10)1

Ans) The amount of data that can be transmitted in a fixed amount of time is known as bandwidth.

For digital devices, the bandwidth is usually expressed in bits per second(bps) or bytes per second. For analog devices, the bandwidth is expressed in cycles per second, or Hertz (Hz)

OR

Bandwidth is referred to the volume of information per unit of time that a transmission medium (like an Internet connection) can handle.

2) Which of the following is not an unit for data transfer rate? (D2010) 1

(i) bps (ii) abps (iii) gbps (iv) kbps

Ans. (ii)abps

2) Which of the following is not a unit for data transfer rate? (OD2010)1

(i) mbps (ii) kbps (iii) sbps (iv) gbps

Ans. (iii) sbps

3) Which of the following unit measures the speed with which data can be transmitted from one node to another node of a network? Also, give the expansion of the suggested unit. (D2007)1

i) Mbps ii) KMps iii) MGps

Ans) Mbps (Mega Bits Per Second)

Theory Question : Protocols

1.Which protocol helps us to transfer files to and from a remote computer? **(2016)**1

Ans FTP OR Telnet OR TCP

2) What is protocol? Which protocol is used to search information from internet using an internet browser? (D2009) 1

Ans A protocol is the set of rules for governing communication between two communication devices. It also infers documentation, negotiations and establishment of rules. Protocol used to search information from internet using an internet browser is :TCP/IP OR HTTP

3) What is protocol? Which protocol is used to copy a file from/to a remotely located server? (OD2009)1

Ans A protocol is the set of rules for governing communication between two communication devices. It also infers documentation, negotiations and establishment of rules. Protocol used to copy a file from/to a remotely located server is FTP (File Transfer Protocol)

4. What is the difference between HTTP and FTP. (2013) 1

Ans:

HTTP	FTP
1. HTTP, is a protocol used to transfer files from a web server onto a browser in order to view a Web page that is on the Internet.	1. FTP, is a protocol used to upload files from a workstation to a FTP server or download files from a FTP server to a workstation.
2. It is used to define the format and Transfer the web page.	2. It is used to transfer the file from one system to another.

5) What is the purpose of using FTP? (1999) 1

SECURITY

1.Arun opened his e-mail and found that his inbox was full of hundreds of unwanted mails. It took him around two hours to delete these unwanted mails and find the relevant ones in his inbox. What may be the cause of his receiving so many unsolicited mails? What can Arun do to prevent this happening in future? 2019MP2

Ans: Arun's email has been attacked with spam.

These may be promotional mails from different advertisement groups. Arun must have checked some promotional offers while surfing the Internet.

He should create filters in his email to stop receiving these unwanted mails.

2. Janish Khanna used a pen drive to copy files from his friend's laptop to his office computer. Soon his office computer started abnormal functioning. Sometimes it would restart by itself and sometimes it would stop different applications running on it. Which of the following options out of (i) to (iv), would have caused the malfunctioning of the computer? Justify the reason for your chosen option:

(i) Computer Virus (ii) Spam Mail

(iii) Computer Bacteria (iv) Trojan Horse (2017)

Ans) (i) Computer Virus **OR** (iv) Trojan Horse

Justification:

- Pen drive containing Computer Virus / Trojan Horse was used before the abnormal functioning started, which might have corrupted the system files.

● Computer Virus/ Trojan Horse affects the system files and start abnormal functioning in the computer

3. Ms. Raveena Sen is an IT expert and a freelancer. She recently used her skills to access the Admin password for the network server of Super Dooper Technology Ltd. and provided confidential data of the organization to its CEO, informing him about the vulnerability of their network security. Out of the following options (i)to (iv), which one most appropriately defines Ms.Sen?
Justify the reason for your chosen option:
(i) Hacker (ii) Cracker
(iii) Operator (iv) Network Admin **(2017)2**
Ans) (i) Hacker : A Hacker is a person who breaks into the network of an organization without any malicious intent.

4) Who is a hacker? (2017MP)1
Ans: A computer enthusiast, who uses his computer programming skills to intentionally access a computer without authorization is known as
hacker. A hacker accesses the computer without the intention of destroying data or maliciously harming the computer.

5)How is a Hacker different from a Cracker? (OD2008)1
Ans) Hackers are the ones who get into someone's code or computer without any malicious intentions, where as Crackers are the one's who get into someone's code or computer with malicious intentions.

6) Difference between Hackers and Crackers? (OD2006)1
Ans)Hackers: Computer enthusiasts who enjoy learning about computer systems and get into other system/network for gaining more knowledge or may find flaws in the system for rectification purposes.
Crackers: Malicious programmers who break into secure systems for stealing and corrupting/spoiling data.

7) What is the basic difference between Computer Worm and Trojan Horse? (2016)1

Trojan Horse	Computer Worm
It is a 'Malware' computer program presented as useful or harmless in order to induce the user to install and run them.	It is a self replicating computer program which uses a network to send copies of itself to other computers on the network and it may do so without any user intervention.

8) What is Trojan Horse? (2015) 1
Ans A Trojan Horse is a code hidden in a program, that looks safe but has hidden side effects typically causing loss or theft of data, and possible system harm.

10) What is the difference between Trojan Horse and Virus in terms of computers? (D2010)1
Ans. TROJAN HORSE: "Malware" computer programs presented as useful or harmless in order to induce the user to install and run them.
VIRUS: Virus is a malicious program that damages data and files and causes harm to computer system.

11) What is the difference between Virus and Worms in the computers? (OD2010)1
Ans.Virus: Virus is a malicious program that damages data and files and causes harm to computer system.
Worms: Worms disrupt services and create system management problems. In some cases worms can install viruses that cause damage to system.

12) How Trojan Horses are different from Worms? Mention any one difference. (MP209-10)1
Ans)A Trojan horse is a term used to describe malware that appears, to the user, to per form a desirable function but, in fact, facilitates unauthorized access to the user's computer system.
A computer worm is a self-replicating computer program. It uses a network to send copies of itself to other nodes (computers on the network) and it may do so without any user intervention.

13) What term we use for a software/hardware device, which is used to block, unauthorized access while permitting authorized communications. This term is also used for a device or set of devices configured to permit, deny, encrypt, decrypt, or proxy all (in and out) computer traffic between different security domains based upon a set of rules and other criteria. (D2010)1
Ans. Firewall
Firewall: Any of a number of security schemes (hardware/software) that
prevent unauthorized users from gaining access to **a** computer network or that monitor transfers of information to and from the network.

14)Define the term firewall. (MP208-10)1
Ans) Firewall is a feature used for Network Security. In a Network there is always danger of information leaking out or leaking in. Firewall is a feature which forces all information entering or leaving the network to pass through a check to make sure that there is no unauthorized usage of the network.

15) How firewall protect our Network? (MP209-10)1
Ans)A **firewall** is a part of a computer system or network that is designed to block unauthorized access while permitting authorized communications. It is a device or set of
devices configured to permit, deny, encrypt, decrypt, or proxy all (in and out) computer traffic between different security domains based upon a set of rules and other criteria.

16) What do you mean by IP Address? How is it useful in Computer Security? 1
Ans) An Internet Protocol (IP) address is a numerical identification and logical address that is assigned to devices connected in a computer network.An IP

Address is used to uniquely identify devices on the Internet and so one can quickly know the location of the system in the network.

17) What do you mean by Spam Mails? How can you protect your mailbox from Spams? (2000)

Ans) Spam mails, also known as junk e-mail, is a subset of spam that involves nearly identical messages sent to numerous recipients by e-mail.

We can protect our mailbox from spams by creating appropriate filters.

18)Give two major reasons to have network security. (MP108-10)1

Ans) Two major reasons to have Network Security are

(i) **Secrecy**: Keeping information out of the reach of unauthorized users.

(ii) **Authentication**: Determining the authorized user before sharing sensitive information with or entering into a business deal.

INTERNET : OTHERS

1. What is the difference between E-Mail and Chat? (2014)1

Ans: In Email, it is not necessary that receiver should be present online when the receiver is sending the E-mail, whereas in Chat, it is must that the communicators should be online at the time of communication.

2) Name any two common Web browsers. (OD2010)1

Ans. Internet explorer,Firefox,Netscape Navigator, Google Chrome, Opera, Safari

3)What is the purpose of using a Web Browser? Name any one commonly used Web Browser. (MP108-10)1

Ans) The **Web Browser** fetches the page requested, interprets the text and formatting commands that it contains, and displays the page properly formatted on the screen.

Example of a Web Browser:

Mozilla Firefox OR Internet Explorer OR Netscape Navigator OR Safari OR OPERA

4) Give one suitable example of each URL and Domain Name (2012)1

Ans URL Example: http://www.w3schools.com/htmlldefault.asp **OR** www.youtube.com

Domain Name Example: w3schools.com

OR

Any other correct URL and Domain Name Examples

Note: Domain names in both the examples may/may not be same

5) What is the importance of URL in networking? (MP208-10) (MP209-10)1

Ans) URL stands for Uniform Resource Locator. Each page that is created for Web browsing is assigned a URL that effectively serves as the page's worldwide name or address. . A URL is also referred to as a Web address.

URL's have three parts: the protocol , the DNS name of the machine on which the page is located and a local name uniquely indicating the specific page(generally the filename).

6) Write two advantages of 3G over 2G Mobile Telecommunication Technologies in terms of speed and services? (2016)1

Ans Speed -

- Faster web browsing
- Faster file transfer

Service -

- Better video clarity
- Better security

7. What is WEB2.0? (2011)1

Ans The term Web 2.0 is associated with **web applications that facilitate participatory information sharing,** interoperability, **user-centered design, and collaboration on the World Wide Web.** Web 2.0 is also used for social networking. Example: **Social Networking Sites, Blogs, Facebook,** Video Sharing Sites, Video Conferencing Applications etc.

8. Write two characteristics of Web 2.0. (2016) 1

Ans ● Makes web more interactive through online social medias

- Supports easy online information exchange
- Interoperability on the internet
- Video sharing possible in the websites

9. Write two characteristics of Wi-Fi. 2014 (1)

Ans: The characteristics of Wi-Fi are as follows:

1. It allows the devices to connect with the netwok without any wire.
2. Group of devices can be connected with single internet connection.

10. Write any two important characteristics of Cloud Computing. 2014

Ans:Two characteristics of Cloud Computing are:

(i) It is controlled by entity and restricted to their authorized user.

(ii) It is delivered through internet 24 X 7.

11. Describe the following in brief:2m (1998)

i)MOSAIC ii)Usenet

Theory Question : Cyber Crimes

(1) Out of the following, which all comes under cyber crime? (2015)1

(i) Stealing away a brand new hard disk from a showroom.

(ii) Getting in someone's social networking account without his consent and posting on his behalf.

(iii) Secretly copying data from server of a organization and selling it to the other organization.

(iv) Looking at online activities of a friends blog.

Ans (ii) & (iii)

2) Which out of the following comes under Cyber Crime? (2012)1

(i) Operating someone's Internet banking account, without his knowledge.

(ii) Stealing a keyboard from someone's computer.

(iii) Working on someone's computer with his/her permission.

Ans (i) Operating someone's Internet banking account, without his knowledge.

3) What is the significance of Cyber law? (OD2007) (D2007)1

Ans) Cyber law encompasses a wide variety of political and legal issues related to the Internet and other communications technology, including intellectual property, privacy, freedom of expression, and jurisdiction.

OR

Cyber law helps prevent Cyber Crime, Hacking, Data theft, Software Piracy and protects rights of Cyber Users.

OR

Restricting unauthorized access to user accounts. Promoting, coordinating and controlling e-business.

4) Write two application of Cyber Law. (D2005)1

Ans)Cyber law encompasses a wide variety of political and legal issues related to the Internet and other communications technology, including intellectual property, privacy, freedom of expression, and jurisdiction.

5) If someone has hacked your Website, to whom you lodge the Complain? (MP1 09-10)1

Ans) The complaint has to be lodged with the Police under IT Act.

Theory Question : XML & HTML

1. Differentiate between XML and HTML. (2011) (OD2005) 1

HTML	XML
Full form is Hyper Text Mark Up Language	**Full form of XML is extensible mark up language**
It contains predefined tags	It contains user defined tags
predominant markup language for the creation of web pages.	Initially visualized as a language for defining new document formats for the World Wide Web
It provides a means to describe the structure of text-based information in a document by denoting certain text as headings, paragraphs, lists, and to supplement that text with interactive forms, embedded images, and other objects using predefined Tags.	XML is textbased formats that provide mechanisms for describing document structures with the help of user defined Tags.

2) When do you prefer XML over HTML and why? (MP209-10)1

Ans) The first benefit of XML is that because you are writing your own markup language, you are not restricted to a limited set of tags defined by proprietary vendors.

Rather than waiting for standards bodies to adopt tag set enhancements (a process which can take quite some time), or for browser companies to adopt each other's standards (yeah right!), **with XML, you can create your own set of tags at your own pace.**

Theory Question : Scripts & Cookies

1) Classify each of the following Web Scripting as Client Side Scripting and Server Side Scripting: (2018)

(i) Java Scripting (ii) ASP

(iii) VB Scripting (iv) JSP

Ans: (i) Client Side Scripting / Server Side Scripting
(ii) Server Side Scripting
(iii) Client Side Scripting
(iv) Server Side Scripting

2)Categories the following under **Client side and Server Side script category? (2016)(2011)**

(i) Java Script (ii) ASP
(iii) VB Sript (iv) JSP

Client Side Scripts	Server Side Scripts
VB Script	**ASP**
Java Script	**JSP**

3) Name one server side scripting language and one client side scripting language. (2012)1

Ans

Ex. Of Client Side Scripts	Ex. Of Server side Scripts
VB Script	ASP
Java Script	JSP
Peril Tcl	PHP
TK	CGI
REXX	Perl

4) Which of the following is not a Client Side script: (MP109-10)1

(i) VB Script (ii) Java Script
(iii) ASP (iv) PHP

Ans)(iii)ASP and (iv) PHP are not client side scripts

5.What are cookies? (2011)

Ans A small piece of information that a server sends to a client. When a person visits a Web site with cookie capabilities, its server sends certain information about him/her to the browser, which is stored on his/her hard drive as a text file. At some later time (such as returning to the site the next day), the server retrieves the cookie.

6) What kind of data gets stored in cookies and how is it useful? (2015)1

Ans When a Website with cookie capabilities is visited , its server sends certain information about the browser, which is stored in the hard drive as a text file. It's a way for the server to remember things about the visited sites.

7) What do you understand by the terms Cookies and Firewall? (OD2005)1

Ans)Cookies: A small piece of information that a server sends to a client When you visit a Web site with cookie capabilities, its server sends certain information about you to your browser, which is stored on your hard drive as a text file. At some later time (such as returning to the site the next day),the server retrieves the cookie. It's a way toi the server to remember things about you.

Theory Question : Open Source Softwares

1. Write the name of any two popular Open Source Software which are used as operating systems. 2014
Ans: Linux and Unix are two open source operating systems.

(2) Write two advantages of using open source software over proprietary software. 2013
A) Two advantages of using open source software over proprietary software are:
Open Source Software is software whose source code is available to customer and it can be modified and redistributed without any limitations whereas source code of proprietary software is not available.
Open Source software may come free of cost or with payment of normal charges whereas proprietary software is neither open nor freely available.

(3) Name two Proprietary softwares along with their application. (2012)1
Ans Microsoft Office - For office applications
Adobe Photoshop - For design related works
Autocad - For professional Design
MAYA - For professional animations & Movie making 3D Studio - For 3 dimensional objects
Tally - For accounting
Oracle Database - For database management

(4) Compare Open Source Software and Proprietary Software. (2011)1
Ans Open source software refers to a program or software in which the source code (the form of the program when a programmer writes a program in a particular programming language) is available to the general public for use and/or modification from its original design free of charge.
Proprietary software is software that is owned by an individual or a company (usually the one that developed it). There are almost always major restrictions on its use, and its source code is almost always kept secret.

6) Write one advantage of each for Open Source Software and Proprietary Software. 1
Ans. An Open Source Software is freely and liberally licensed because of which users have right to study, change. and improve its design and source code. A Proprietary Software has a copyright owner, who can restrict the user's control over the software, its modification, or restrictions in publishing of modified or unmodified versions.

7) Mention any two advantages of Open Source Software over Proprietary Software. (2000)
Ans) Open Source's proponents often claim that it offers significant benefits when compared to typical Proprietary Software. Proprietary Software typically favour visible features (giving marketing advantage) over harder-to measure qualities such as stability,security and similar less glamorous attributes.
Open Source Software developers are evidently motivated by many factors but favouring features over quality is not noticeable amongst them. For many developers, peer review and acclaim is important, so it's likely that they will prefer to build software that is admired by their peers. Highly prized factors are clean design, reliability and maintainability, with adherence to standards and shared community values preeminent.

8)Compare freeware and Shareware. (MP209-10)1
Ans)Freeware, the name derived from words "free" and"software". It is a computer software that is available for use at no cost or for an optional fee. Freeware is generally proprietary software available at zero price, and is not free software. The author usually restricts one or more rights to copy, distribute, and make derivative works of the software.
Shareware is usually offered as a trial version with certain features only available after the license is purchased, or as a full version, but for a trial period. Once the trial period has passed the program may stop running until a license is purchased. Shareware is often offered without support, updates, or help menus, which only become available with the purchase of a license. The words "free trial" or "trial version" are indicative of shareware.

Mislleneous

1) The following is a 32 bit binary number usually represented as 4 decimal values, each representing 8 bits, in the range 0 to 255 (known as octets) separated by decimal points. 140.179.220.200
What is it? What is its importance? (2017MP)1
Ans: It is an IP Address.It is used to identify the computers on a network.

2) What out of the following, will you use to have an audio-visual chat with an expert sitting in a far-away place to fix-up a technical issue? 2012
(i) VolP(ii) Email(iii) FTP
Ans (ii) VolP

NETWORKS FULL FORMS

ARPANET - Advanced Research Projects Agency Network
CDMA – Code Division Multiple Access
FTP - FILE TRANSFER PROTOCOL
FSF - FREE SOFTWARE FOUNDATION
GPRS – General Packet Radio Service
GNU - GNU's not Unix
GSM – Global System for Mobile (communication)
HTML - Hyper Text Markup Language
HTTP – Hyper Text Transfer Protocol
MAN - Metropolitan Area Network
MODEM - Modulator - Demodulator
PPP - Point To Point Protocol
SMS - Short Message/Messaging Service
SMTP – Simple Mail Transfer Protocol
TCP/IP - Transfer Control Protocol/Internet Protocol
URL – Uniform Resource Locator
VoIP - Voice Over Internet Protocol
WAN - Wide Area Network
WLL(WiLL) – Wireless in Local Loop
WWW - World Wide Web
XML – eXtensible Markup Language

THE ABOVE FULL FORMS ARE PREVIOUSLY ASKED QUESTIONS

NSFNET - National Science Foundation Network
LAN - Local Area Network
PAN - Personal Area Network
NIU - Network Interface Unit
NIC - Network Interface Card
TAP - Terminal Access Point(NIU = NIC = TAP)
bps - Bits Per Second
Bps - Bytes Per Second
Kbps – Kilo bits Per Second
KBps – Kilo Bytes Per Second
Mbps - Mega Bits Per Second
MBps – Mega Bytes Per Second
Gbps - Giga Bits Per Second
GBps – Giga Bytes Per Second
KHz – Kilo Hertz
MHz – Mega Hertz
GHz – Giga Hertz
THz – Tera Hertz
NFS – Network File System
VGM – Voice Grade Medium
DGM – Data Grade Medium
STP – Shielded Twisted Pair
UTP – Unshielded Twisted Pair
LED – Light Emitting Diode
LD – Laser Diode
OFC – Optic Fiber Cable, Fiber Optic Cable
PDA – Personal Digital Assistants

AM – Amplitude Modulation
FM - Frequency Modulation
PM – Phase Modulation
A/F – Audio Frequency
(Txd – Transmit, Rxd – Receive,
RTS – Request to Send, CD –Carrier Detect,
DSR – Data Set Ready, CTS – Clear to Send
DTR – Data Terminal Ready)
RJ45 – Registered Jack – 45
BNC – Bayone – Neill – Concelman

AUI – Attachment Unit Interface

SNA – Systems Network Architecture
VFIR – Very Fast Infrared
URI – Uniform Resource Identifier
URN – Uniform Resource Name
P-P - Point to Point
MIME – Mail and Multipurpose Internet Mail Extensions
POP – Post Office Protocol
NNTP – Network News Transfer Protocol
HTTP – Hyper Text Transfer Protocol
NTP – Network Time Protocol
IMAP – Internet Mail Transfer Protocol
SLIP – Serial Line Internet Protocol
SIP – Session Initiation Protocol
PPP - Point to Point Protocol
IPCP – IP Control Protocol
NCP – Network Control Protocol
LCP – Link Control Protocol
ITU – International Telecommunications Union
PC – Personal Computer
ISP – Internet Service Provider
SIM – Subscriber Identity Module
TDMA – Time Division Multiple Access
TDM – Time Division Multiplexing
IDEN – Integrated Digital Enhanced Network
WCDMA –Wideband CDMA
PSTN – Public Switched Telephone Network
1G, 2G, 3G, 4G, 5G – Fifth Generation
UMTS – Universal Mobile Telecommunications System / Universal Mobile Telephone System
EDGE – Enhanced Data rates for Global Evolution
SMSC – Short Message Service Center
HLR – Home Location Register
Email – Electronic Mail
Fax – Fascimile
VSNL – Videsh Sanchar Nigam Limited
DNS – Domain Name Server
DHTML– Dynamic Hyper Text Markup Language
DECnet – Digital's family of communication protocols
IE – Internet Explorer
WiFi - Wireless Fidelity
LTE – Long Term Evolution
HDTV – High Definition Television
WiMAX -Worldwide Interoperability for Microwave Access
ISD - International Subscriber Dialing
ISDN - Integrated Services Digital Network
IRC - Internet Relay Chat
BWA – Broadband Wireless Access
PHP - Hypertext Preprocessor (earlier called.Personal Home Page)
UNCITRAL – United Nation's Commission for International Trade related laws.
IT Act – The Information Technology Amendment Act
IP – Intellectual Property
FAT – File Allocation Table

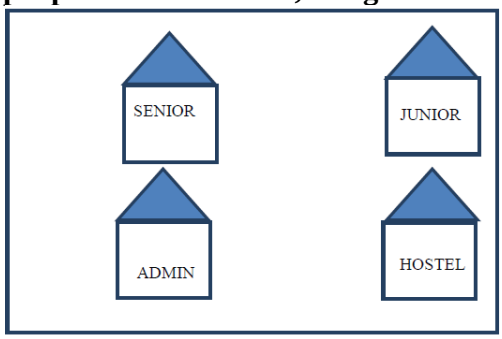
"If wealth is lost, nothing is lost,
If health is lost, something is lost,
If character is lost, everything is lost"

"THE FEAR OF THE LORD IS THE BEGINNING OF WISDOM"

4Marks Problem : Model 1(All in a single city)

1. Multipurpose Public School, Bangluru is Setting up the network between its Different Wings of school campus. There are 4 wings Named as SENIOR(S),JUNIOR(J), ADMIN(A) and HOSTEL(H). 2019MP4

Multipurpose Public School, Bangluru



Distance between various wings are given below:

WingAtoWingS	100m
WingAtoWingJ	200m
WingAtoWingH	400m
WingStoWingJ	300m
WingStoWingH	100m
WingJtoWingH	450m

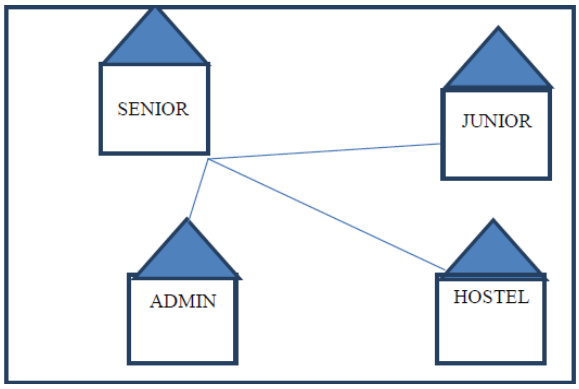
Number of Computers installed at various wings are as follows:

Wings	NumberofComputers
WingA	20
WingS	150
WingJ	50
WingH	25

(i) Suggest the best wired medium and draw the cable layout to efficiently connect various wings of Multipurpose PublicSchool, Bangluru.

Answer:

Best wired medium: Optical Fibre OR CAT5 OR CAT6 OR CAT7 OR CAT8 OR Ethernet Cable



(ii) Name the most suitable wing where the Server should be installed. Justify your answer.

Answer:

Wing Senior(S)- Because it has maximum number of computers.

(iii) Suggest a device/software and its placement that would provide data security for the entire network of the School.

Answer: Firewall - Placed with the server at Senior

(iv) Suggest a device and the protocol that shall be needed to provide wireless Internet access to all smartphone/laptop users in the campus of Multipurpose Public School, Bangluru.

Answer:

Device Name: WiFi Router OR WiMax OR RF Router OR Wireless Modem OR RFTransmitter

Protocol : WAP OR 802.16 OR TCP/IP OR VOIP OR MACP OR 802.11

2) CASE STUDY BASED QUESTION: (2018)

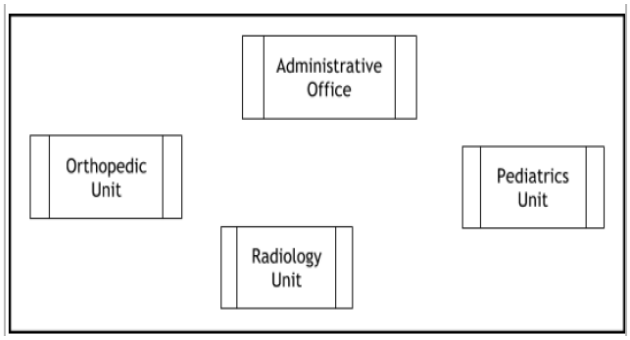
Ayurveda Training Educational Institute is setting up its centre in Hyderabad with four specialized departments for Orthopedics, Neurology and Pediatries along with an administrative office in separate buildings. The physical distances between these department buildings and the number of computers to be installed in these departments and administrative office are given as follows. You, as a network expert, have to answer the queries as raised by them in (i) to (iv)

Shortest distances between various locations in meters:

Administrative office to Orthopedics Unit	55
Neurology Unit to Administrative Office	30
Orthopedics Unit to Neurology Unit	70
Pediatrics Unit to Neurology Unit	50
Pediatrics Unit to Administrative Office	40
Pediatrics Unit to Orthopedics Unit	110

Number of Computers installed at various locations are as follows:

Pediatrics Unit	40
Administrative Office	140
Neurology	50
Orthopedics Unit	80

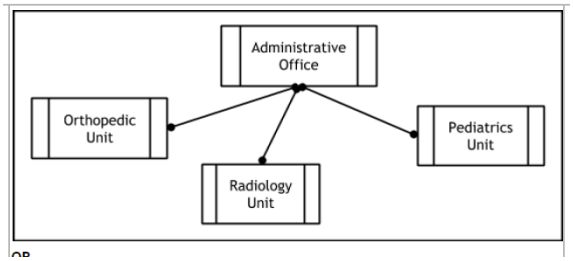


(i) Suggest the most suitable location to install the main server of this institution to get efficient connectivity.

Ans: **Administrative Office**

(ii) Suggest the best cable layout for effective network connectivity of the building having server with all the other buildings.

Ans:



OR

Administrative Office is connected to Orthopedic, Radiology, Pediatrics units
directly in a Star Topology

(iii) Suggest the devices to be installed in each of these buildings for connecting computers installed within the building out of the following:

* Gateway * Modem * Switch

Ans: Switch

(iv) Suggest the topology of the network and network cable for efficiently connecting each computer installed in each of the buildings out of the following:

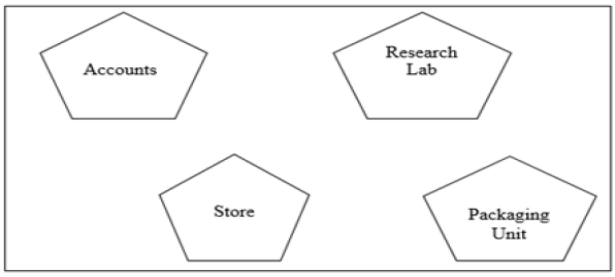
Topologies: Bus Topology, Star Topology

Network Cable: Single Pair Telephone, Coaxial Cable, Ethernet Cable.

Topology : Star Topology

Network Cable: Ethernet Cable / Coaxial Cable

3) Rehaana Medicos Center has set up its new center in Dubai. It has four buildings as shown in the diagram given below: (2017MP)



Distances between various buildings are as follows:

Accounts to Research Lab	55 m
Accounts to Store	150 m
Store to Packaging Unit	160 m
Packaging Unit to Research Lab	60 m
Accounts to Packaging Unit	125 m
Store to Research Lab	180 m

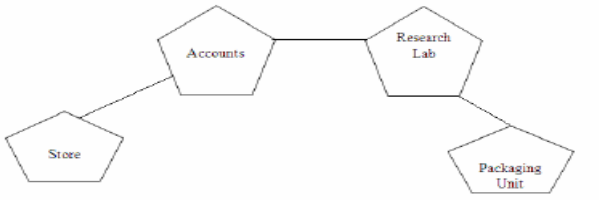
Number of Computers

Accounts	25
Research Lab	100
Store	15
Packaging Unit	60

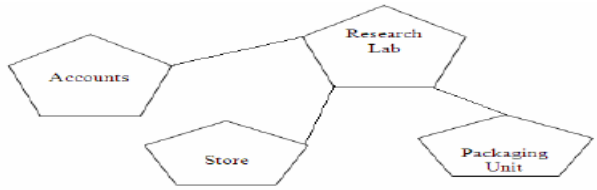
As a network expert, provide the best possible answer for the following queries:

i) Suggest a cable layout of connections between the buildings.

(i) Layout 1



Layout 2



ii) Suggest the most suitable place (i.e. buildings) to house the server of this organization.

Ans) The most suitable place/ building to house the server of this organization would be building Research Lab, as this building contains the maximum number of computers.

iii) Suggest the placement of the following device with justification: a) Repeater b) Hub/Switch

a) For layout1, since the cabling distance between Accounts to Store is quite large, so a repeater would ideally be needed along their path to avoid loss of signals during the course of data flow in this route. For layout2, since the cabling distance between Store to Recresearch Lab is quite large, so a repeater would ideally be placed.

b) In both the layouts, a Hub/Switch each would be needed in all the buildings to interconnect the group of cables from the different computers in each building.

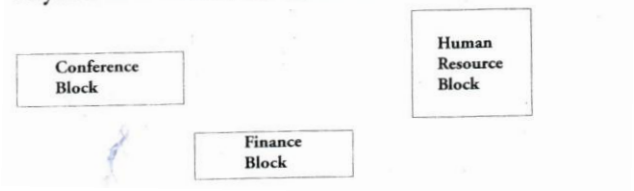
iv) Suggest a system (hardware/software) to prevent unauthorized access to or from the network.

A) Firewall

4) 2014

Tech Up Corporation (TUC) is a professional consultancy company. The company is planning to set up their new offices in India with its hub at Hyderabad. As a network adviser, you have to understand their requirement and suggest them the best available solutions. Their queries are mentioned as (i) to (iv) below.

Physical locations of the blocks of TUC



Block to Block distances (in Mtrs.)

Block (From)	Block (To)	Distance
Human Resource	Conference	60
Human Resource	Finance	120
Conference	Finance	80

Expected Number of Computer to be installed in each bloc

Block	Computers
Human Resource	125
Finance	25
Conference	60

(i) What will be the most appropriate block, where TU should plan to install their services?

(ii) Draw a block to block cable layout to connect all tl buildings in the most appropriate manner for efficie communication.

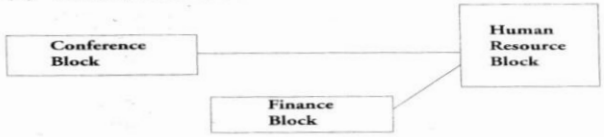
(iii) What will be the possible connectivity out of the followin you will suggest to connect the new setup of offices Hyderabad with its London based office.

- **Infrared**
- **Satellite Link**
- **Ethernet Cable**

Answer:

(i) Human Resource Block is appropriate to install t server.

(ii) CABLE LAYOUT:



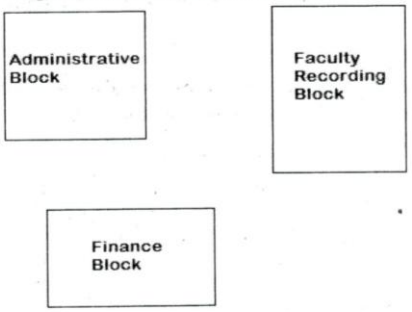
(iii) Satellite Link

(iv) Switch

5)2013

(c) Rovenza Communication International (RCI) is an online corporate training provider company for IT related courses. The company is setting up their new campus in Kolkata. You as a network expert have to study the physical locations of various blocks and the number of computers to be installed. In the planning phase, provider the best possible answer for the queries (i) to (iv) raised by them. 4

Physical Locations of the blocks RCI



Block to Block distance (in Mtrs.)

From	To	Distance
Administrative Block	Finance Block	60
Administrative Block	Faculty Recording Block	120
Finance Block	Faculty Recording Block	70

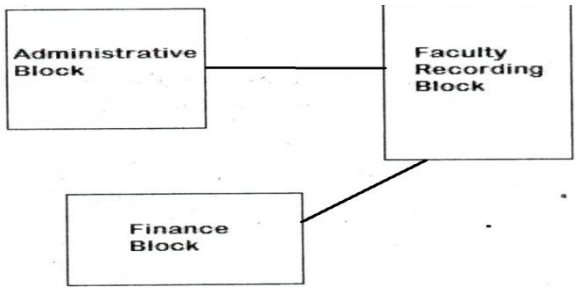
Expected computers to be installed in each block

Block	Computers
Administrative Block	**30**
Finance Block	**20**
Faculty Recording Block	**100**

(i) Suggest the most appropriate block, where RCI should plan to install the server.

A) Faculty Recording Block is most appropriate block to install the server.

(ii) Suggest the most appropriate layout to connect all three blocks for efficient communication.



(iii) Which type of network out of the following is formed by connecting the computers of these three blocks?

LAN MAN WAN

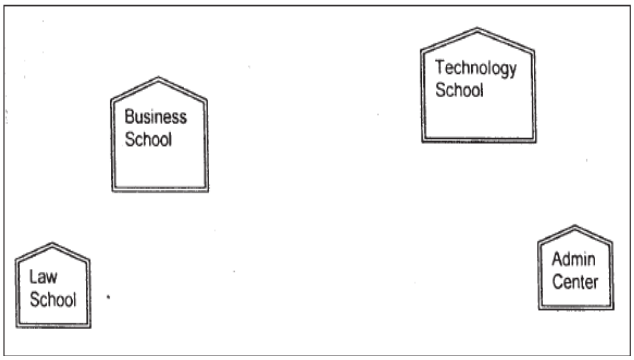
A)LAN

(iv) Which wireless channel out of the following should be opted by RCI to connect to students from all over the world?

Infrared Microwave Satellite

A) Satellite.

6.Great Studies University is setting up its Academic schools at Sunder Nagar and planning to set up a network. The university has 3 academic schools and one administration center as shown in the diagram below: (2011) 4



Center to center distances between various buildings is as follows :

Law School to Business School	60m
Law School to Technology School	90m
Law School to Admin Center	115m
Business School to Technology School	40m
Business School to. Admin Center	45m
Technology School to Admin Center	25m

Number of Computers in each of the Schools/Center is follows:

Law School	25
Technology School	50
Admin Center	125
Business School	35

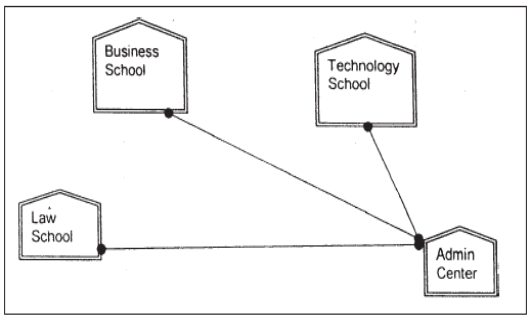
(i) Suggest the most suitable place (i.e. School/ Center) to install the server of this university with a suitable reason. 1

Ans Option 1 : Admin center as it has the most number of computers

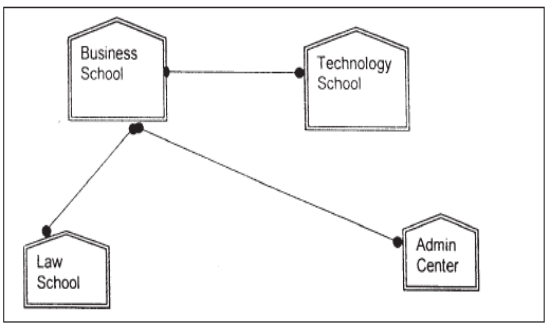
Option 2.Business School as it will require minimum cable length to connect other blocks

(ii) Suggest an ideal layout for connecting these schools/ center for a wired connectivity. 1

Ans Option 1:



Option 2:



(iii) Which device will you suggest to be placed/installed in each of these schools /

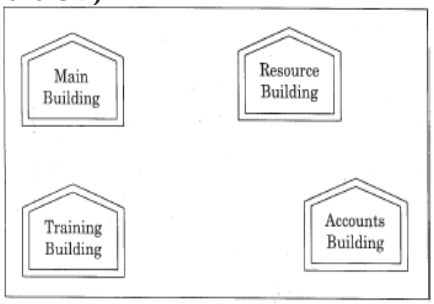
center to efficiently connect all the computers within these schools / center? 1

Ans Switch

(iv) The university is planning to connect its admission office in the closest big city, which is more than 350 km from the university. Which type of network out of LAN, MAN or WAN will be formed? Justify your answer.1

Ans WAN as the distance is more than the range of LAN or MAN. 1

7) "Vidya for All" is an educational NGO. It is setting up its new campus at Jaipur for its web-based activities. The campus has four buildings as shown in the diagram below: (2010 OD) 4



Center to center distances between various buildings as per architectural drawings (in meters) is as follows:

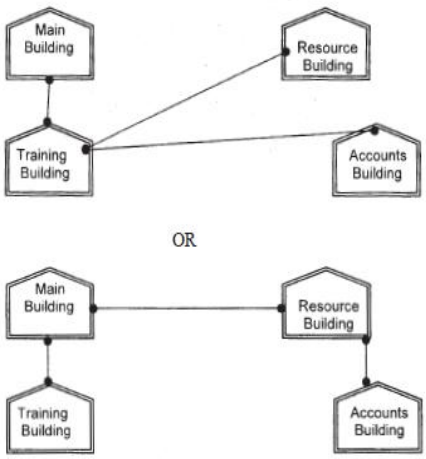
Main Building to Resource Building	120 m
Main Building to Training Building	40 m
Main Building to Accounts Building	135 m
Resource Building to Training Building	125 m
Resource Building to Accounts Building	45 m
Training Building to Accounts Building	110 m

Expected Number of Computers in each Building is as follows:

Main Building	15
Resource Building	25
Training Building	250
Accounts Building	10

(el) Suggest a cable layout of connections between the buildings.

Ans.



OR

(e2) Suggest the most suitable place (i.e. building) to house the server for this NGO. Also, provide a suitable reason for your suggestion.

Ans. Training Building as it contains maximum number of computers.

(e3) Suggest the placement of the following devices with justification:

(i) Repeater(ii) Hub/Switch

Ans. (i) A Repeater should be placed when the distance between any two connecting buildings exceeds 70 m.

(ii) Every building will need one Hub / Switch, to send signals to all of the workstations connected to it

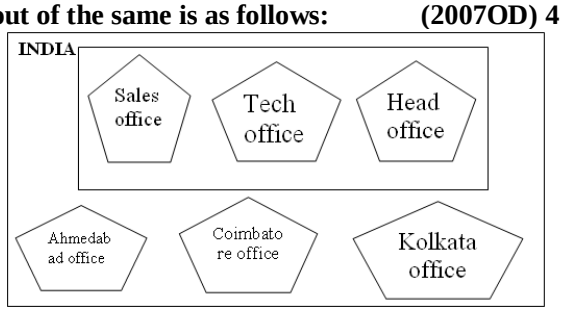
(e4) The NGO is planning to connect its International office situated in Delhi. Which out of the following wired communication links, will you suggest for a very high speed connectivity ?

(i) Telephone Analog Line(ii) Optical Fiber

(iii) Ethernet Cable

Ans. (ii) Optical Fibre

8) "Hindustan Connecting World Association "is planning to start their offices in four major cities in India to provide regional IT infrastructure support in the field of Education & Culture. The company has planned to set up their head office in New Delhi in three locations and have named their New Delhi offices as "Sales Office ","Head Office "and "Tech Office ".The company's regional offices are located at "Coimbatore","Kolkata"and "Ahmadabad". A rough layout of the same is as follows: (2007OD) 4



Approximate distance between these offices as per network survey team is as follows

Place From	Place To	Distance
Head Office	Sales Office	10 KM
Head Office	Tech Office	70 KM
Head Office	Kolkata Office	1291KM
Head Office	Ahmadabad Office	790 KM
Head Office	Coimbatore Office	1952KM

In continuation of the above, the company experts have planned to install the following number of computers in each of their offices:

Head Office	100
Sales Office	20
Tech Office	50
Kolkata Office	50
Ahmadabad Office	50
Coimbatore Office	50

1) Suggest network type(out of LAN,MAN,WAN) for connecting each of the following set of their offices:
Head Office and Tech Office
Head Office and Coimbatore Office

Ans) Head Office and Tech Office: **LAN**
Head Office and Coimbatore Office: **WAN**

2) Which device you will suggest to be produced by the company for connecting all the computers with in each of their offices out of the following devices?
Modem Telephone Switch/Hub

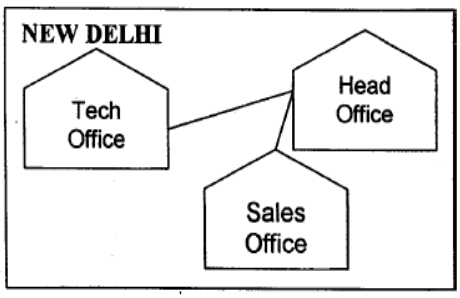
Ans) Switch / Hub

3) Which of the following communication media, will suggest to be procured by the company for connecting their local offices in New Delhi for very effective and fast communication?
Ethernet Cable, Optical Fibre,Telephone Cable

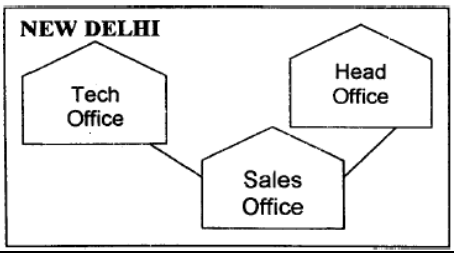
Ans) Optical Fibre

4) Suggest a cable/writing layout for connecting the company's local offices located in New Delhi. Also, suggest an effective method /technology for connecting the company's regional offices at "Kolkata","Coimbatore"and "Ahmadabad".

Ans) Optical Fiber/Star Topology
Wireless



OR



9) INDIAN PUBLIC SCHOOL in Darjeeling is setting up the network between its different wings. There are 4 wings named as SENIOR(S), JUNIORS (J), ADMIN (A) and HOSTEL (H). (2006OD)

Distance between various wings is given below:

Number of Computers

Wing A	10
Wing S	200
Wing J	100
Wing H	50

i) Suggest a suitable Topology for networking the computer of all wings.1

Ans) Star Topology **OR** Bus Topology

ii) Name the wing where the server to be installed. Justify your answer. 1m

Ans) Wing S
as it has the maximum number of computers

OR

WingA as it is placed in the Admin Wing (for security reasons)

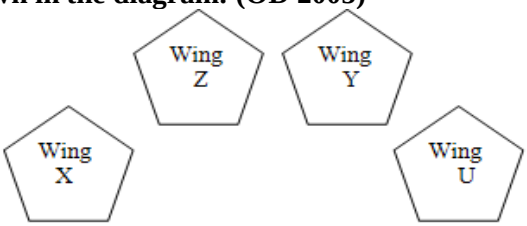
iii) Suggest the placement of Hub/Switch in the network.

Ans) Inside all the four wings

iv) Mention in economic technology to provide internet accessibility to all wings. 1m

Ans: Any one of the following:
Dialup, TCP/IP, DSL, Modem, Broadband, Cable, ISDN, Telephone Line, Co-axial, Ethernet Cable, Radiowave

10) The Cyber Mind Organization has set up its new Branch at Mizoram for its office and web based activities. It has 4 Wings of buildings as shown in the diagram: (OD 2005)



Center to center distances between various blocks

Wing X to Wing Z	40 m
Wing Z to Wing Y	60 m
Wing Y to Wing X	135 m
Wing Y to Wing U	70 m
Wing X to Wing U	165 m
Wing Z to Wing U	80 m

Number of computers

Wing X	50
Wing Z	130
Wing Y	40
Wing U	15

1) Suggest a most suitable cable layout of connections between the Wings, and topology. 1m

2) Suggest the most suitable place (i.e., Wing) to house the server of this organization with a suitable reason, with justification. 1m

Ans) Wing Z as it has largest number of computers

3) Suggest the placement of the following devices with justification:1m

(i)Repeater (ii) Hub/Switch

4) The organization is planning to link its head office situated in Delhi with the offices at Srinagar.1m Suggest an economic way to connect it; the company is ready to compromise on the speed of connectivity. Justify your answer. 2m

Ans)TCP/IP Dial Up (Most Suitable answer 1)

OR

Telephone Link (Most Suitable answer 2)

OR

Microwave

OR

Radio Link/Radio Wave

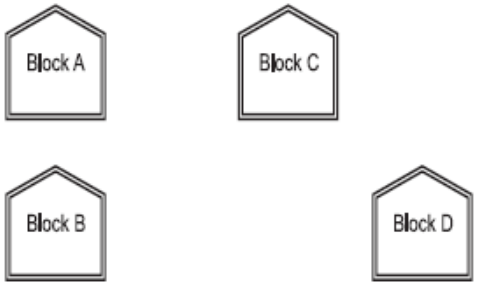
OR

Satellite Link

OR

WAN

11)Knowledge Supplement Organisation has set up its new center at Mangalore for its office and web based activities. It has 4 blocks of buildings as shown in the diagram below: (MP109-10)4



Center to center distances between various blocks

Black A to Block B	50 m
Block B to Block C	150 m
Block C to Block D	25 m
Block A to Block D	170 m
Block B to Block D	125 m
Block A to Block C	90 m

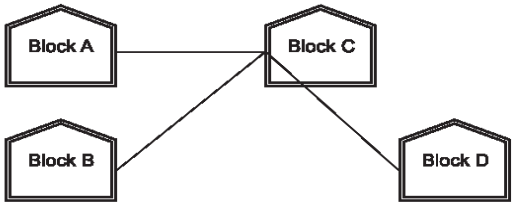
Number of Computers

Black A	25
Block B	50
Block C	125
Block D	10

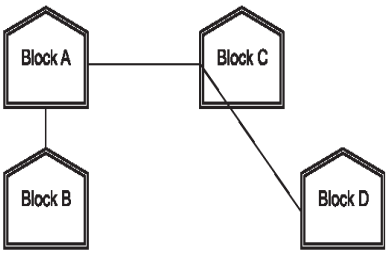
e1) Suggest a cable layout of connections between the blocks.

Ans)

Layout Option 1:



Layout Option 2: Since the distance between Block A and Block B is quite short



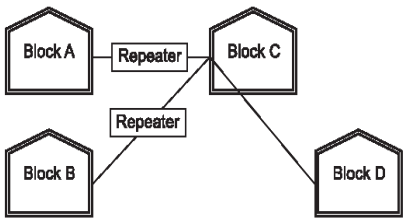
e2) Suggest the most suitable place (i.e. block) to house the server of this organization with a suitable reason.

Ans) The most suitable place / block to house the server of this organisation would be Block C, as this block contains the maximum number of computers, thus decreasing the cabling cost for most of the computers as well as increasing the efficiency of the maximum computers in the network.

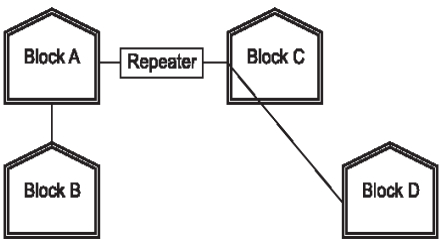
e3) Suggest the placement of the following devices with justification

(i) Repeater (ii) Hub/Switch

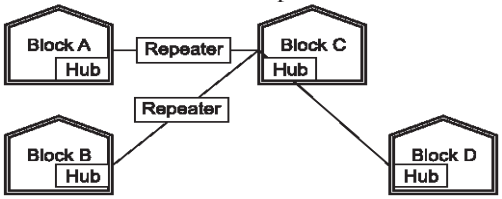
Ans) (i) For Layout 1, since the cabling distance between Blocks A and C, and that between B and C are quite large, so a repeater each, would ideally be needed along their path to avoid loss of signals during the course of data flow in these routes.

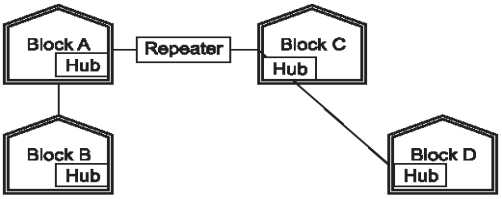


For layout 2, since the distance between Blocks A and C is large so a repeater would ideally be placed in between this path.



(ii) In both the layouts, a hub/switch each would be needed in all the blocks, to interconnect the group of cables from the different computers in each block.

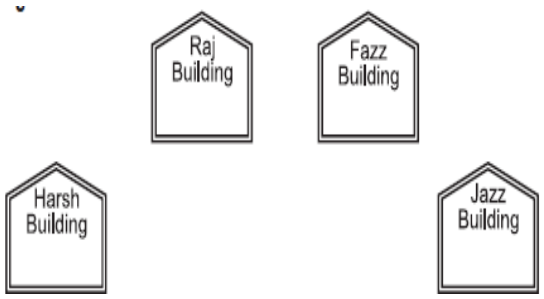




e4) The organization is planning to link its front office situated in the city in a hilly region where cable connection is not feasible, suggest an economic way to connect it with reasonably high speed?

Ans) The most economic way to connect it with a reasonable high speed would be to use radio wave transmission, as they are easy to install, can travel long distances, and penetrate buildings easily, so they are widely used for communication, both indoors and outdoors. Radio waves also have the advantage of being omni directional, which is they can travel in all the directions from the source, so that the transmitter and receiver do not have to be carefully aligned physically.

12) Ravya Industries has set up its new center at Kaka Nagar for its office and web based activities. The company compound has 4 buildings as shown in the diagram below: (MP209-10) 4

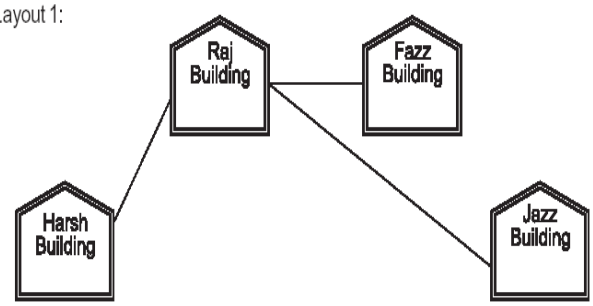


Center to center distances between various buildings is as follows:	
Harsh Building to Raj Building	50 m
Raz Building to Fazz Building	60 m
Fazz Building to Jazz Building	25 m
Jazz Building to Harsh Building	170 m
Harsh Building to Fazz Building	125 m
Raj Building to Jazz Building	90 m
Number of Computers in each of the buildings is follows:	
Harsh Building	15
Raj Building	150
Fazz Building	15
Jazz Bulding	25

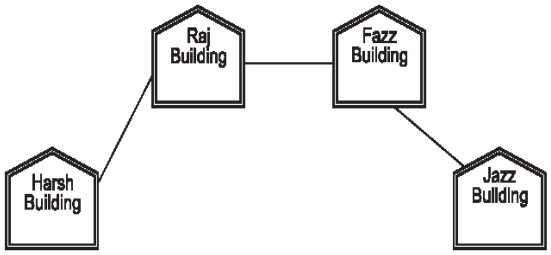
e1) Suggest a cable layout of connections between the buildings.

Ans)

Layout 1:



Layout 2: Since the distance between Fazz Building and Jazz Building is quite short



e2) Suggest the most suitable place (i.e. building) to house the server of this organization with a suitable reason.

Ans) The most suitable place / block to house the server of this organisation would be Raj Building, as this block contains the maximum number of computers, thus decreasing the cabling cost for most of the computers as well as increasing the efficiency of the maximum computers in the network.

e3) Suggest the placement of the following devices with justification:

(i) Internet Connecting Device/Modem

(ii) Switch

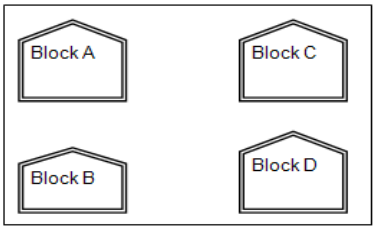
Ans)(i)Raj Building

(ii) In both the layouts, a hub/switch each would be needed in all the buildings, to interconnect the group of cables from the different computers in each block

e4) The organisation is planning to link its sale counter situated in various parts of the same city, which type of network out of LAN, MAN or WAN will be formed? Justify your answer.

Ans) The type of network that shall be formed to link the sale counters situated in various parts of the same city would be a MAN, because MAN (Metropolitan Area Networks) are the networks that link computer facilities within a city.

13)Knowledge Supplement Organisation has set up its new center at Mangalore for its office and web based activities. It has 4 blocks of buildings as shown in the diagram below: (MP108-09)



Center to center distances between various blocks

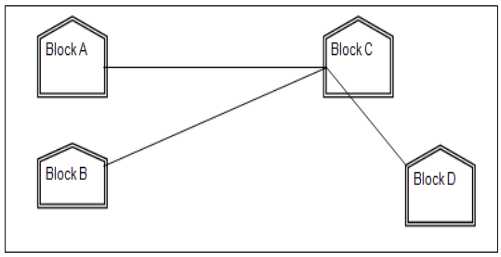
Black A to Block B	50 m
Block B to Block C	150 m
Block C to Block D	25 m
Block A to Block D	170 m
Block B to Block D	125 m
Block A to Block C	90 m

Number of Computers

Black A	25
Block B	50
Block C	125
Block D	10

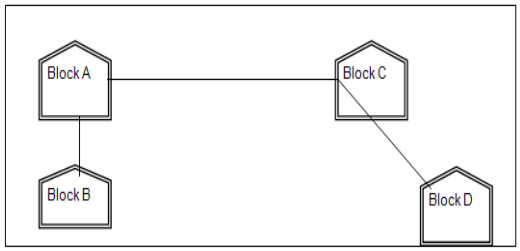
e1) Suggest a cable layout of connections between the blocks.1

Ans)Layout 1:



Layout Option 2:

Since the distance between Block A and Block B is quite short



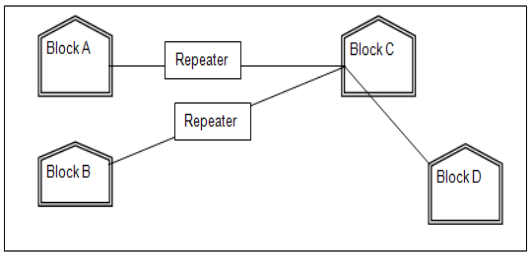
e2) Suggest the most suitable place (i.e. block) to house the server of this organisation with a suitable reason. 1

Ans) The most suitable place / block to house the server of this organisation would be Block C, as this block contains the maximum number of computers, thus decreasing the cabling cost for most of the computers as well as increasing the efficiency of the maximum computers in the network.

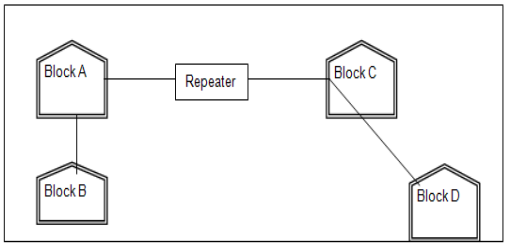
e3) Suggest the placement of the following devices with justification 1

i)Repeater ii)Hub/Switch

Ans) For Layout 1, since the cabling distance between Blocks A and C, and that between B and C are quite large, so a repeater each, would ideally be needed along their path to avoid loss of signals during the course of data flow in these routes

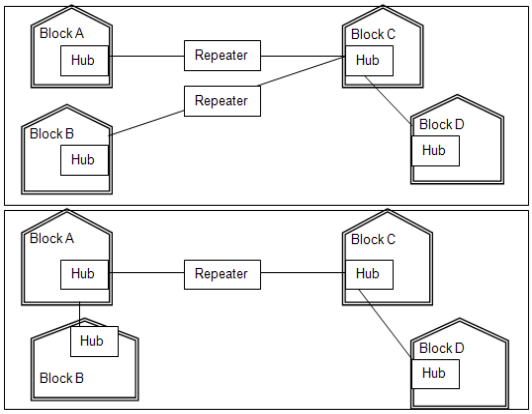


For layout 2, since the distance between Blocks A and C is large so a repeater would ideally be placed in between this path



In both the layouts, a hub/switch each would be needed in all the blocks, to interconnect the group of cables from the different computers in each block

Layout 1



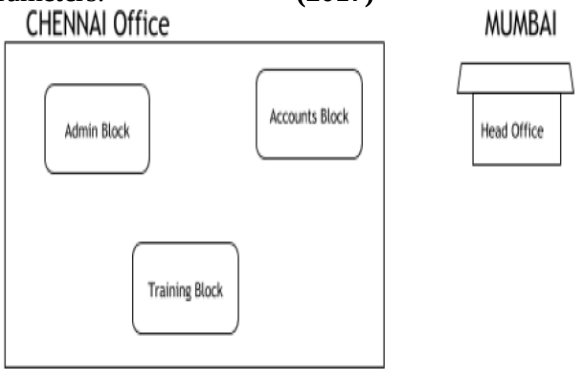
e4) The organization is planning to link its front office situated in the city in a hilly region where cable connection is not feasible, suggest an economic way to connect it with reasonably high speed? 1

Ans) The most economic way to connect it with a reasonable high speed would be to use radio wave transmission, as they are easy to install, can travel long distances, and penetrate buildings easily, so they are widely used for communication, both indoors and outdoors. Radio waves also have the advantage of being omni directional, which is they can travel in all the directions from the source, so that the transmitter and receiver do not have to be carefully aligned physically.

4Marks Problem : Model 2 (Between 2 distant places)

1)Hi Standard Tech Training Ltd is a Mumbai based organization which is expanding its office set-up to Chennai. At Chennai office compound, they are planning to have 3 different blocks for Admin, Training and Accounts related activities. Each block has a number of computers, which are required to be connected in anetwork for communication, data and resource sharing.

As a network consultant, you have to suggest the best network related solutions for them for issues/problems raised by them in (i) to (iv), as per the distances between various blocks/locations and other given parameters. **(2017)**



Shortest distances between various blocks/locations:

Admin Block to Account Block	300 Metres
Accounts Block to Training Block	150 Metres
Admin Block to Training Block	200 Metres
MUMBAI Head Office to CHENNAI Office	1300 KM

Number of computers installed at various blocks are as follows:

Training Block	150
Accounts Block	30
Admin Block	40

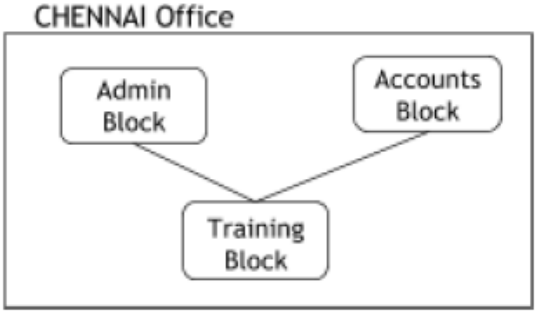
i) Suggest the most appropriate block/ location to house the SERVER in the CHENNAI Office (out of the 3 blocks) to get the best and effective connectivity. Justify your answer. (1)

Ans) Training Block - Because it has maximum number of computers.

ii) Suggest the best wired medium and draw the cable layout (Block to Block) to efficiently connect various blocks within the CHENNAI office compound. 1

Ans) Best wired medium:

Optical Fibre **OR** CAT5 **OR** CAT6 **OR** CAT7 **OR** CAT8 **OR** Ethernet Cable



iii) Suggest a device/software and its placement that would provide data security for the entire network of the CHENNAI office. (1)

Ans) Firewall - Placed with the server at the Training Block **OR**

Any other valid device/software name

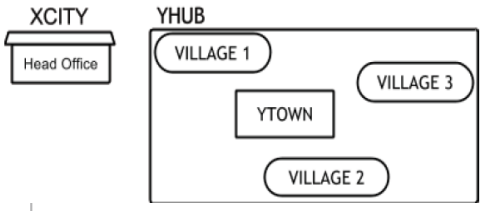
iv) Suggest a device and the protocol that shall be needed to provide wireless Internet access to all smartphone/laptop users in the CHENNAI office(1)

A)Device Name: WiFi Router **OR** WiMax **OR** RF Router **OR** Wireless Modem **OR** RF Transmitter

Protocol : WAP **OR** 802.16 **OR** TCP/IP **OR** VOIP **OR** MACP **OR** 802.11

2)Intelligent Hub India is a knowledge community aimed to uplift the standard of skills and knowledge in the society. It is planning to setup its training centers in multiple towns and villages pan India with its head offices in the nearest cities.They have created a model of their network with a city, a town and 3 villages as follows: (2016) 4

As a network consultant, you have to suggest the best network related solutionsfor their issues/problems raised in (i) to (iv), keeping in mind the distances between various locations and other given parameters.



Shortest distances between various locations:

VILLAGE 1 to YTOWN	2 KM
VILLAGE 2 to YTOWN	1.5 KM
VILLAGE 3 to YTOWN	3 KM
VILLAGE 1 to VILLAGE 2	3.5 KM
VILLAGE 1 to VILLAGE 3	4.5 KM
VILLAGE 2 to VILLAGE 3	3.5 KM
CITY Head Office to YHUB	30 Km

Number of Computers installed at various locations are as follows:

YTOWN	100
VILLAGE 1	10
VILLAGE 2	15
VILLAGE 3	15
CITY OFFICE	5

Note: In Villages, there are community centers, in which one room has been given as training center to this organization to install computers.The organization has got financial support from the government and top IT companies.

(i) Suggest the most appropriate location of the SERVER in the YHUB (out of the 4 locations), to get the best and effective connectivity. Justify your answer. 1

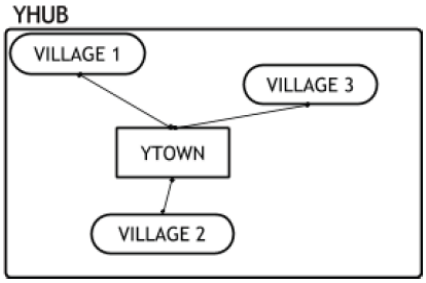
Ans YTOWN

Justification

- Since it has the maximum number of computers.
- It is closest to all other locations.

(ii) Suggest the best wired medium and draw the cable layout (location to location) toefficiently connect various locations within the YHUB. 1

Ans Optical Fiber



(iii) Which hardware device will you suggest to connect all the computers within each location of YHUB? 1

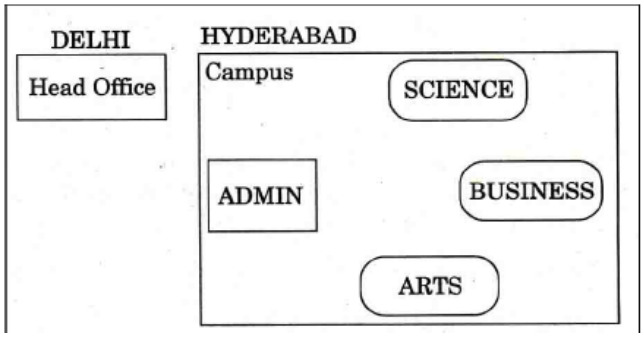
Ans Switch OR Hub

(iv) Which service/protocol will be most helpful to conduct live interactions of Experts from Head Office and people at YHUB locations? 1

Ans Videoconferencing OR VoIP OR any other correct service/protocol

3) Xcelencia Edu Services Ltd. is an educational organization. It is planning to set up its India campus at Hyderabad with its head office at Delhi. The Hyderabad campus has 4 main buildings -
ADMIN, SCIENCE, BUSINESS and MEDIA.

You as a network expert have to suggest the best network related solutions for their problems raised in (i) to (iv), keeping in mind the distances between the buildings and other given parameters. (2015)



Shortest Distances between various buildings:	
ADMIN to SCIENCE	65M
ADMIN to BUSINESS	100m
ADMIN to ARTS	60M
SCIENCE to BUSINESS	75M
SCIENCE to ARTS	60M
BUSINESS to ARTS	50M
DELHI Head Office to HYDERABAD Campus	1600KM

Number of Computers installed at various building are as follows:

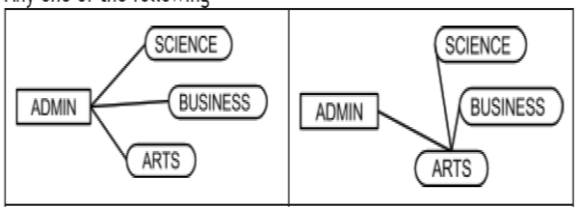
ADMIN	100
SCIENCE	85
BUSINESS	40
ARTS	12
DELHI Head Office	20

(i) Suggest the most appropriate location of the server inside the HYDERABAD campus (out of the 4 buildings), to get the best connectivity for maximum no. of computers. Justify your answer.**1**

Ans ADMIN (due to maximum number of computers)

(ii) Suggest and draw the cable layout to efficiently connect various buildings 'within the HYDERABAD campus for connecting the computers.

Any one of the following



(iii) Which hardware device will you suggest to be procured by the company to be installed to protect and control the intemet uses within the campus?1

Ans Firewall OR Router

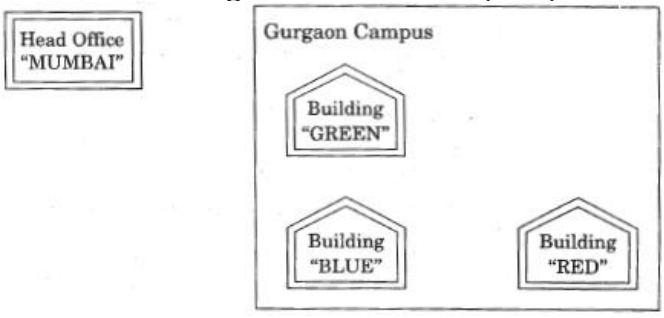
(iv) Which of the following will you suggest to establish the online face-to-face communication between the people in the Admin Office of HYDERABAD campus and DELHI Head Office?

(a) E-mail (b) Text Chat (c) Video Conferencing

(d) Cable TV 1

Ans Video Conferencing

4)Workalot Consultants are setting up a secured network for their office campus at Gurgaon for their day-to-day office and web-based activities. They are planning to have connectivity between 3 buildings and the head office situated in Mumbai Answer the questions (i) to (iv) after going through the building positions in the campus and other details, which are given below: (2012) 3



Distances between various buildings

Building "GREEN" to Building "RED"	110 m
Building "GREEN" to Building "BLUE"	45 m
Building "BLUE" to Building "RED"	65 m
Gurgaon Campus to Head Office	1760 KM

Number of Computers

Building "GREEN"	32
Building "RED"	150
Building "BLUE"	45
Head Office	10

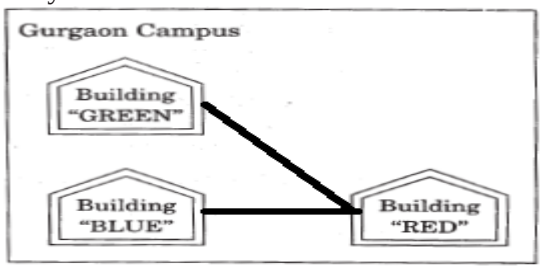
(i) Suggest the most suitable place (Le. building) to house the server of this organization. Also give a reason to justify your location.

Ans Building "RED", since it contains maximum number of computers **OR**

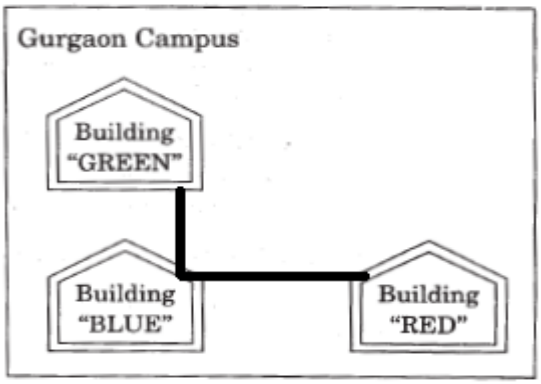
Building "BLUE", since it is closest to "GREEN" and "RED"

(ii) Suggest a cable layout of connections between the buildings inside the campus.

Ans Layout 1:



Layout 2



(iii) Suggest the placement of the following devices with justification:

(1) Switch (2) Repeater

Ans (1) Switch:

In each of the buildings, since a network switch is a networking device that joins multiple computers together within one local area network (LAN).

(2) Repeater:

For the Layout 1 drawn in (e2)- Between buildings "GREEN" and "RED", since distance between these two buildings is greater than 70 m which will otherwise lead to loss of signal intensity for data to be transferred.

For the Layout 2 drawn in (e2): Repeater is not needed, since distance between both the buildings connected to "Ganga" is less than 70 m, not leading to any signal loss **OR**

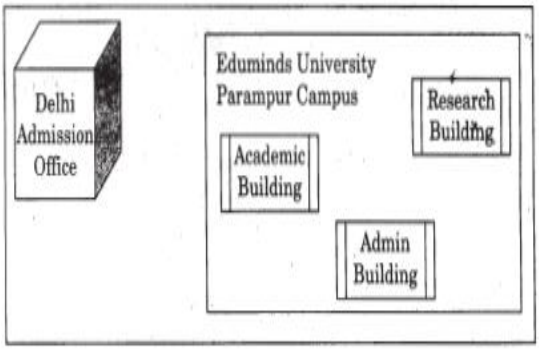
Any other placement of Repeater with proper justification

(iv) The organization is planning to provide a high speed link with its head office situated in the MUMBAI using a wired connection. Which of the following cable will be most suitable for this job?

(i) Optical Fibre (ii) Co-axial Cable (iii) Ethernet Cable

Ans (i) Optical Fibre

5) Eduminds University of India is starting its first campus in a small town Parampur of Central India with its center admission office in Delhi. The university has 3 major buildings comprising of Admin Building, Academic Building and Research Building in the 5 KM area Campus. As a network expert, you need to suggest the network plan as per (E1) to (E4) to the authorities keeping in mind the distances and other given parameters. (2009 OD)



Expected Wire distances between various locations:

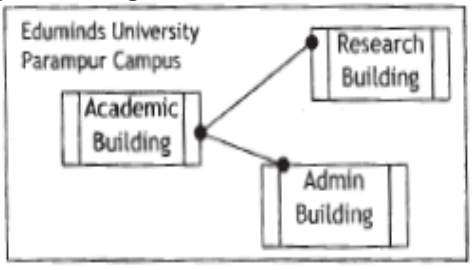
Research Building to Admin Building	90m
Research Building to Academic Building	80m
Academic Building to Admin Building	15m
Delhi Admission Office to Parampur Campus	1450 km

Expected number of computers to be installed at various locations in the university are as follows:

Research Building	20
Academic Building	150
Admin Building	35
Delhi Admission Office	5

(E1) Suggest to the authorities, the cable layout amongst various buildings inside the university campus for connecting the buildings. 1

Ans)



(E2) Suggest the most suitable place (i.e. building) to house the server of this organisation, with a suitable reason. 1

Ans Academic Building as it contains maximum number of computers.

(E3) Suggest an efficient device from the following to be installed in each of the buildings to connect all the computers : 1

(i) GATEWAY (ii) MODEM (iii) SWITCH

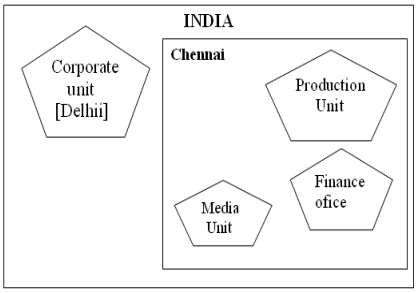
Ans SWITCH

(E4) Suggest the most suitable (very high speed) service to provide data connectivity between Admission Building located in Delhi and the campus located in Par am pur from the following options: 1

_ Telephone line
_ Fixed-Line Dial-up connection
_ Co-axial Cable Network
_ GSM
_ Leased line
_ Satellite Connection

Ans Satellite Connection **OR** Leased line

6)"China Middleton Fashion" is planning to expand their network in India, starting with two cities in India to provide infrastructure for distribution of their product. The company has planned to setup their main office in Chennai at three different locations and have named their offices as "Production Unit", "Finance Unit" and "Media Unit ".The Company has its corporate unit in Delhi. A rough layout of the same is as follows: (2008 OD)



Approximate distance between these Units is as follows:

From	To	Distance
Production Unit	Finance Unit	70 Mtr
Production Unit	Media Unit	15 KM
Production Unit	Corporate Unit	2112 KM
Finance Unit	Media Unit	15 KM

In continuation of the above, the company experts have planned to install the following number of computers in each of their offices:

Production Unit	158
Finance Unit	79
Media Unit	90
Corporate Unit	51

1) Suggest the kind of network required (out of LAN, MAN, WAN) for connecting each of the following office units: i) Production Unit and Media Unit

ii) Production Unit and Finance Unit

Ans) Production Unit and Media Unit : **MAN**

Production Unit and Finance Unit : **LAN**

2) Which one of the following devices will you suggest for connecting all the computers with in each of their office units? i) Switch/Hub ii) Modemii) Telephone

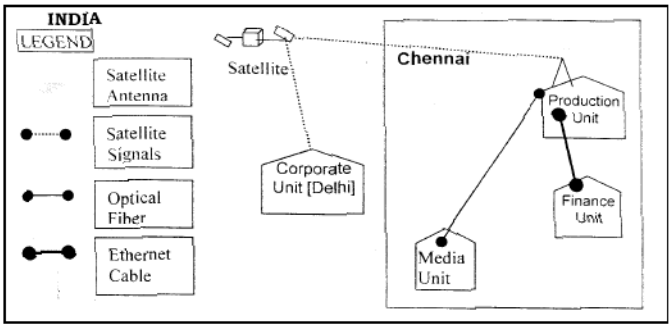
Ans) Switch / Hub

3) Which of the following communication media, you will suggest to be procured by the company for connecting their local office units in Chennai for very effective (High Speed) communication?
i) Telephone cable ii) Optical Fibre iii) Ethernet Cable

Ans) Optical Fibre

4) Suggest a cable/wiring layout for connecting the company's local office units located in Chennai. Also, suggest an effective method/technology for connecting the company's office unit located in Delhi.

Ans)



Optical Fiber/Star Topology

Wireless/Satellite Link/leased Line

For Any Doubts or for good suggestions…….

Please feel free to contact:

MRK

ptlspecialsolutions@gmail.com

VERY IMPORTANT NOTICE

DEAR READER,

This material is meant only for slow learners to give an idea of questions pattern. If any student systematically practice these models, will get good marks (but not full marks).

Especially we cannot guess the theory questions. Theory questions will come from any corner of the syllabus. (Some times only theory questions were asked from the previous questions)

BUT STUDENTS ARE ADVISED TO READ ENTIRE SYLLABUS TO GET FULL MARKS.

As I collected this material from various sources, there might be some typing errors or technical errors, etc.